

PETERSEN'S PHOTOGRAPHIC MAGAZINE

Photographic

Petersen's Photographic Magazine

OCTOBER, 1976

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**SPECIAL
DARKROOM
ISSUE**

**How To Increase
Film Speed**

**Instant Color
Printing**

**Tricolor
Pointillism**

**Slideless
Color Prints**

**SPECIAL
SECTION:**

**The Return of
Nuts & Bolts**

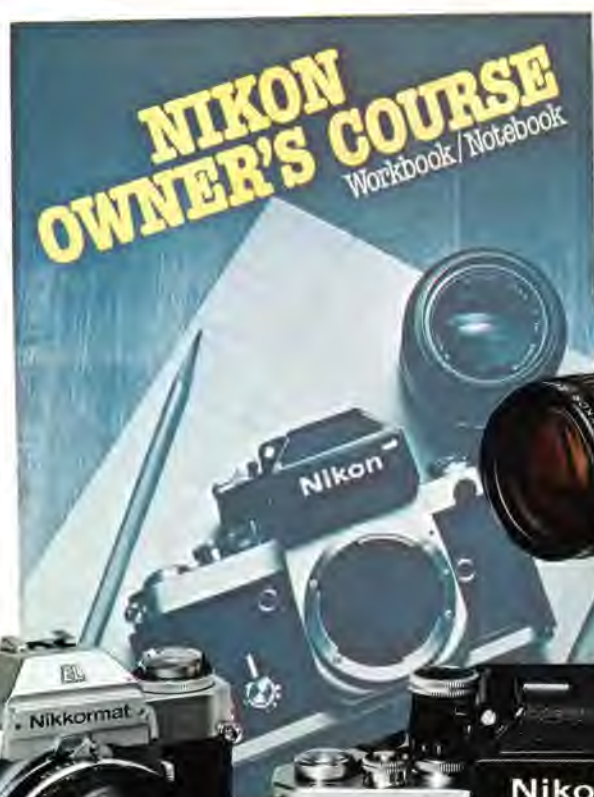


OCTOBER, 1976



A GOLDEN OPPORTUNITY TO OWN NIKON

**You've always wanted a Nikon.
You've always known that,
someday, you'd have one.
And your own Nikon System, too.
Someday could be today.
For right now you have a
Golden Opportunity to own Nikon**



Golden Opportunity

Golden Opportunity is actually your opportunity to stop compromising and actually own a Nikon camera... the only camera you ever really wanted. Because, if you buy and take delivery of a new Nikon or Nikkormat SLR camera during our Golden Opportunity program, Nikon will send you a Nikon System Certificate. It's worth up to \$50 toward the purchase of any Nikon accessory, lens or camera that's in-stock or deliverable by your participating Nikon dealer. Finally, Nikon will send you a **Free** ticket to the Nikon Owner's Course, 4 hours of concentrated camera basics — a \$10 value. Here's what you get during Golden Opportunity when you buy Nikon.

WHEN YOU PURCHASE	YOU RECEIVE, FREE
NIKON F2 (all models)	\$50 NIKON SYSTEM CERTIFICATE, NIKON OWNER'S COURSE
NIKKORMAT EL (all models)	\$35 NIKON SYSTEM CERTIFICATE, NIKON OWNER'S COURSE
NIKKORMAT FT2	\$15 NIKON SYSTEM CERTIFICATE, NIKON OWNER'S COURSE
NIKON R8 MOVIE CAMERA	\$50 NIKON SYSTEM CERTIFICATE

NOTE: Since your additional purchase using your Nikon System Certificate must be selected from your participating Nikon Dealer's inventory, you should check which Nikon products he has available, prior to making your initial camera purchase.

Greater value than ever! The superb Nikkormat FT2

The most moderately priced member of the Nikon family has always been the most outstanding value in all photography — only now more so! A truly fine Nikon made camera, unusually fast and easy to use, with the accuracy of Nikon center-weighted metering. The Nikkormat FT2 has a rugged metal focal plane shutter with speeds to 1/1000th and automatic electronic flash synch at 1/125th, through a built-in hot shoe or the single synch terminal. Most people buy it with the economical 50mm f2 Auto-Nikkor lens, enhanced by the exclusive Nikon Integrated Coating — as are virtually all Nikkor lenses. And every one fits the Nikkormat FT2... It's the perfect entree into fine photography and the Nikon System!

Nikon quality, automated The amazing Nikkormat EL

Built to Nikon standards, with the speed and convenience of fully automatic exposure control when you want it! Simply set the lens aperture — the electronically-controlled shutter is automatically ad-

justed with center-weighted accuracy! The meter system utilizes an exclusive Nikon-designed Functional Resistance Element, which is far more reliable and long lasting than other systems. And Nikon's own innovative Memory Lock which simplifies difficult lighting situations. The superior "aperture priority" system used by the EL lets you pre-select the lens aperture for optimum sharpness, or for the depth of field you want. It also means that **any** reflex viewing lens, or other optical device retains fully automatic exposure control. Of course the Nikkormat EL accepts all of the more than 50 Nikkor lenses each precision made, with all-metal construction... those same lenses, which in quality, optical originality and quantity, eclipse all other lens systems.

Your opportunity to own the finest—Nikon F2

With Golden Opportunity savings, it becomes unusually easy to own the finest camera the world of 35mm photography has to offer. The Nikon F2. Built to unparalleled Nikon standards of precision which simply do not exist elsewhere, it is used by an overwhelming majority of professionals. Backed by the most complete system in 35mm photography, there is no challenge it cannot meet. For Nikon is a totally interchangeable camera: there are six finders, 19 finder screens, accessory backs, 35mm photography's most advanced motor drive system and a host of other items available to suit your purpose and your preference. The camera itself boasts total viewing accuracy, perfect multiple exposure registration even with motor drive, a supremely accurate focal plane shutter with titanium foil curtain, and of course... matchless Nikon center-weighted metering.

Nikon quality in super-8 movies... the Nikon R8

Combine features such as dissolve and automatic fade controls, speeds to 54 fps, reverse filming up to 100 frames and double system sound capability — then add an incredibly sharp, macro focus 8X Nikkor zoom lens. That's the Nikon R8 super-8 movie camera, and it's one of the most advanced in filmmaking. And right now during Golden Opportunity, it's decidedly the greatest value!

It's your chance to buy any of these fine Nikon cameras now, during the Golden Opportunity program. Your opportunity to get unheard of savings on Nikon cameras — to get a Nikon System Certificate in addition... and a free ticket to the Nikon Owner's Course. You'll never get a better deal than right now. Come in to your Nikon dealer for complete details.

Nikon Inc., Garden City, N.Y. 11530.

Subsidiary of Ehrenreich Photo-Optical Industries, Inc. 

Nikon. It was worth waiting for. But you needn't wait any longer.

Offer good only in the United States between August 15, 1976 and December 31, 1976. Void where prohibited by law.

OUT OF THE
ORDINARY...
...INTO

TAMRON
70-150



Specifications:
Tamron 70-150mm f/3.8
Auto Zoom:
Construction:
12 elements in 10 Groups
Angle of View: 34°-16°
**Minimum Focus from
Film Plane:** 54.0"
Filter Size: 52mm
Dimensions: 2.5" x 4.6"
Weight: 16.4 Oz. with
Built-In Retractable
Lens Hood

The Tamron 70-150mm f/3.8 Automatic Zoom is an extraordinary SLR lens. About 1/2 the weight of conventional zooms. An incredibly light 16.4 ounces and just 4.6" long! It gives you the creative potential of 81 individual focal lengths. Optimal sharpness and contrast are achieved through Tamron's patented BBAR multiple-layer coating and innovative computer design. It focuses to a close 54" from the film plane, excellent for close-cropped portraits and interesting candid shots. And, it cross-couples perfectly to the automatic exposure and TTL metering controls of more than 250 principal SLR models. Ask your Tamron dealer today for an "on-camera" demonstration of the Tamron 70-150 zoom.

The extraordinary Tamron 70-150mm f/3.8 zoom is just one of a complete system of wide angle, telephoto and zoom lenses.



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Tamron Custom Mounts for more than 250 principal SLR cameras including • Canon FD/EF • Fujica • Konica Autoreflex • Leicaflex SL/SL2 • Mamiya/Sekor • Minolta SRT/X • Miranda Sensorex • Mal • Nikon • Nikkormat • Olympus OM-Series • Pentax ES/F & K series • Pentax/Praktica • Rollei SL • Topcon

Write for your copy of the comprehensive Tamron Guide to Automatic SLR Lenses.

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COVER

Model Valerie Campbell was photographed indoors using existing, diffuse window light as part of the tests conducted by Technical Editor David Brooks for his feature story

entitled, "A Shot in the Dark Gets a Shot in the Arm," which begins on page 46. Kodak Ektachrome-X Film was exposed in a Mamiya M645 with a handmade, soft-focus lens (described in the January, 1973 issue). Exposure was $\frac{1}{8}$ second at f/6.3.



OTHER VOICES

FORWARD TO US

Please address all inquiries about the "black leather pouch, with a silklike lining..." described in "Follow the Light," page 40, August, 1976 issue, to PhotoGraphic Magazine, 8490 Sunset Blvd., Los Angeles, California 90069, and not to Larsen Enterprises as recommended in the article.—Ed.

SENSITIVE EYE

The fine photographs displayed in the May, 1976 portfolio, "Linda Wolf; Faces In Time," once again reinforce the point that, despite all the hype to buy more and more equipment, a camera with a normal lens and a photographer with a sensitive eye are all that is needed to create some truly memorable images. Thank you for a fine series of photos as well as an issue with excellent articles.

Ed Ciolkosz
Manchester, Connecticut

HIDDEN MODIFIERS

I've just finished reading the May, 1976 issue cover to cover (the way I always read your publication). And as I take for granted, it was bursting with useful, informative articles and thought-provoking opinions, but what really intrigued me was "One to One." It dealt with a response to a question from Ann Wardell, who was considering whether or not to pursue a career in photography in spite of doubts about it being a "realistic choice" for a woman in what she perceived to be a "field... strictly for men."

Mr. Brooks' reply was strong and convincing. Honestly, though, his strongest evidence was obviously hidden by the vagaries of publishing deadlines. Ms. Wardell should take a closer look at the "Table of Contents" of the May issue—particularly the "Features" section. I see that eight of eight signed articles or essays are by women. In addition, the cover photo, "Club Close-Ups," "Blueprint" and "Focus on Filmmaking" are all by women. I rest my case. Ann, today's valid question is not "Are you a woman?" but rather, "Are you a photographer?"

George Somers
Matawan, New Jersey

OUT OF THE DEPTHS

I recently ran into a problem while trying to construct the darkroom sink

described in "Plumbing the Depths" in the February, 1976 issue. I've called marine suppliers in my area, and they are unfamiliar with the Imperial Zar varnish called for in the article. What they do have is Z-Spar varnish.

They also suggested that Mr. Seng clarify which type of varnish—bakelite, plastic or urethane—should be used to avoid adverse reaction with darkroom chemicals.

I now own \$50 worth of plywood cut and ready to assemble. I hope you'll be able to supply me with the necessary information so I can build my own waterproof sink that's impervious to darkroom chemicals.

J.R. McBride
Foster City, California

Let me help you get that sink together, Mr. McBride. For my sinks I used Gloss ZAR crystalite coating, a clear, high gloss finish for wood. It's manufactured by UGL (United Gilsonite Laboratories), Scranton, Pennsylvania 18501, and Beverlee Division, Visalia, California 93277. UGL makes a tougher varnish called Imperial ZAR, which I recommend in the article. Use three to four coats of Imperial or four to five coats of Gloss, and that should do it.—Walt Seng.

BAG VS. TRIPOD

Whoever goes to the effort of building a beanbag platform for their tripod is missing the entire idea (see "A Bag to Steady Your Camera Anywhere," July, 1976 issue). A beanbag is a great steadiness device but not so much as a tripod—although it does fit in a camera bag or suitcase better! But for maximum support, stick to the tripod. To use both only defeats the advantages of either, and only a masochist would carry two tools, when one would do the job quite adequately.

Sam Garcia
Denver, Colorado

OLD BAGS, NEW USES

The article, "A Bag to Steady Your Camera Anywhere," in the July, 1976 issue was very helpful. However, I would like to suggest an easier way to make your own bags. Simply cut the legs off a pair of old blue jeans; sew one end closed; fill with sand/beans, and sew the other end closed. Each pair of jeans will yield two bags and a pair of shorts for yourself, husband or wife and kids.

Or you might approach the neighborhood trap or skeet shooter and obtain an empty shot bag or two from him/her. Most clay target shooters reload

their own ammo and have plenty of the highest quality canvas bags that bird-shot comes packed in lying about the house. He or she will probably be glad to give you some, but it wouldn't hurt to offer something in return for them.

Tim Kirkland
Cuero, Texas

NO JOKING MATTER

I was distressed to read in your July, 1976 issue Mr. Novak's gratuitous and tasteless reference to Hitler's birthday in his, "In Just Seconds" column. Any reference to Hitler's birthday or existence is neither a joking matter nor a light matter to most responsible Americans.

I, and others, have been affronted by this insensitive and sophomoric reference to Hitler. A public apology is due your American and especially your Jewish reading public. I trust this protest will not go unheeded.

Leslie J. Mann
Irvington, New Jersey

It was not the intention of PhotoGraphic, or Mr. Novak, to make light of a dark period in the world's history. The mention was merely an observation, not occasion for celebration. To Mr. Mann and all others who may have been offended we offer our sincere apologies.—Ed.

ANOTHER MATCH

It's a shame that in your article, "A Not So Odd Match" (see "Video Vignettes," September, 1976 issue), you failed to mention the country's oldest and most successful video introduction service. We are VideoDate, a nationwide company with a two-year track record of success. VideoDate has offices in New York; New Jersey; Washington, D.C.; Chicago, and Los Angeles.

An interesting aspect of the operation is the type of people we attract. We do not attract the losers or desperate people but the attractive and self-confident, because if a person does not have a positive self-concept or doesn't think that they have something special to offer, they will not come in to be put on our tapes.

For women, VideoDate is a "nonsexist" alternative—everything about the meeting is equal with none of the bar-scene dynamics. The anxiety of being rejected or of having to reject someone is removed.

I hope this letter will inform your readers about VideoDate.

Jonathan Stein, President
VideoDate
1045 Galey Ave., Suite 104
Los Angeles, California 90024



Kodak announces the new look in color photography.



Now. Instant pictures

Introducing Kodak instant cameras and film.



Press the shutter release, and watch what develops right before your eyes. In a few minutes, the image will emerge from the white background to become a finished color print. With vibrant reds, vivid blues, saturated greens, and beautiful flesh tones.

Imagine. Instant pictures with color by Kodak.

We could paint a rainbow of words to describe the exciting pictures you can get with Kodak instant cameras and film. We could have commissioned world-famous photographers to dazzle you.

But we'd rather not promise you rainbows or show you magic. We want you to judge for yourself. At your photo dealer's. And with the kind of pictures you like to take—day in, day out.

What to look for.

One of the first things you'll like is the feel of the cameras. We've made them easy to hold, easy to use. So you can concentrate on composing the picture.

The simplicity of design disguises sophisticated camera technology and



with color by Kodak.

production techniques. Which allow us to build in a lot of features that won't cost you a lot of money.

We've also made Kodak instant cameras rugged and reliable. So you can expect years of fine pictures.

In fact, we back them with a *Full 3-year Warranty*.

Now, about the film.

The new Kodak instant print film is designed for Kodak instant cameras only. Each pack holds ten exposures



and can be loaded in the camera only one way. Correctly.

We made the image in the popular rectangular shape (2 5/8" x 3 5/8") so you

can frame your shots two ways.

Each print is like a miniature color darkroom. Dry when they're ejected from the camera, the prints are enclosed in protective plastic and develop themselves without timing, peeling, or litter.

Take a closer look at the print surface. What you'll see is the Kodak SatinluxTM finish. It's slightly textured to reduce fingerprinting and scratches. And to enhance the beauty of the print.

A whole new way of making color images.

Our film story is 19 layers deep and incredibly complex. It's studded with terms like dye-releasing agents, oxidized developer scavengers, and direct reversal emulsions.

But what sets Kodak instant print film apart are the fundamental breakthroughs we've made in imaging

chemistry. Which let us eliminate color couplers and use dye releasers. This, we feel, gives our film a new level of color fidelity.

What this all means to you is quite simple. You get beautiful colors from film by Kodak. Only now, you get them in an instant.

For more details about Kodak instant cameras, see the next page.

For a closer look at the new look in color photography, see your photo dealer



Actual-size pictures.



Your choice of features, your choice of prices.

Both Kodak instant cameras are big on features, small on price. Both come with a 137 mm, $f/11$, 3-element coated lens. Automatic daylight exposure control with a manual lighten/darken override of ± 1 stop. Electronic shutter from 1/300 to 1/20 sec. Automatic flash exposure from 4 to 10 feet. Optical, projected-frame viewfinder with low-light signal.

The continuous focusing ranges from 3½ feet to infinity. It's quick and simple. A bright, zooming circle in the viewfinder expands and contracts as you slide the focus control. If your subject is an adult, just match the circle to the head and you're in focus.

There are many other features. A battery tester (the battery is in the camera), film pack loading, film pack extractor, tripod socket, socket for 8-shot flipflash, wrist strap, personalizing monograms.

KODAK EK4 Instant Camera.

Our basic, budget-priced model (we call it "The Crank") has all the above features, plus a manual ejector for prints. Just shoot and crank, shoot and crank. Quietly. Picture after beautiful picture. Or shoot in one place and crank out in another. Less than \$54.

KODAK EK6 Instant Camera.

Spend a little more, get a little more convenience. Instead of the crank, there's an electric motor-drive film advance. So when you release the shutter release, out comes the print. Automatically. Less than \$70.

No matter which one you pick, you're getting instant pictures with color by Kodak. And that's worth seeing.

Kodak instant cameras and film.



Prices are subject to change without notice.

ON THE SCENE

THE EDITORS



BEZ



BRAENDLE



BROOKS



COX



GREEVES



PFISTER

NO TRICKS, JUST TREATS, TREATS, TREATS

Hobgoblins and horny toads for Halloween? You won't find any in our October issue. Instead, sit down and enjoy this month's exciting potpourri of feature articles....

To begin, **Frank Bez** reveals his unusual techniques for impressionistic photos in "Tricolor Pointillism." Starting on page 62, the article shows how to break up a photographic image into dots of saturated primary colors which, when viewed, suggest a complete tonal range. The secret's in using theatrical gels and making your own grain texture screen....

While other photo magazines are frantic in their endeavors to compare Polaroid's SX-70 Film to Kodak's new Instant Print Film, contributor **Peter Barber's** come up with a fast and simple way to make high quality color prints with *either* film from full-color slides. The process can be completed with any darkroom enlarger equipped with color head or with color printing filters. All the necessary processing equipment is right in the SX-70 or Kodak EK6 or EK4 Instant Print Film camera. For more information turn to "Instant Color Printing," beginning on page 112....

For a color adventure that's just plain fun, see "Photos from a Palette," by **Charles Braendle**, on page 54. Braendle's colorful abstractions are the result of filmless color printing. The colors are painted onto glass and printed directly from the glass surface. As you can see, the results can be really wild!...

Elsewhere in this issue, Technical Editor **David Brooks** discusses new developments in available light. In his article, "A Shot in the Dark Gets a Shot in the Arm," beginning on page 46, Brooks shares his information on the latest methods to increase film speed. The accompanying illustrations show how to maintain good tone separation and gradation, preserve detail and obtain good definition when shooting in available light....

This month's portfolio by advertising photographer **Jim Wood** is not at all the super-slick commercial fare that many of us have come to expect from this area of photography. Wood's posters, ads and packages, instead, present graphics and vignettes that evoke a mood or a feeling we can easily relate to. To see what we mean please turn to page 77....

Back by popular demand is the ever-enlightening "Nuts and Bolts," an outstanding compilation of nitty gritty do-it-yourself ideas, a veritable compendium of photographic esoterica, a compository of pictorial adjuncts that will be enthusiastically constructed and fondly remembered long after the yellowing of the pages these gadgets were gleaned from. With plans, illustrations and text by **David Busch, Charles Check, Hubert Cox, Joe Greeves and Herbert Pfister**, this intriguing feature begins on page 94.

COMING NEXT MONTH:

HOW TO PHOTOGRAPH CHILDREN—A special section on snapping small fry.

PLUS:

FLASHBULBS, REDISCOVERED—All the light output you'll ever want for a fraction of what you'd expect to pay.

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VOIGTLANDER IS BACK



For those who know the proud name and reputation of Voigtlander, its return is news indeed. Too long unavailable in the U.S., Voigtlander is older than photography itself—and always synonymous with quality, precision and value. Voigtlander was actually making optical instruments long before the invention of photography. In 1840, the first Voigtlander camera—probably the first anywhere designed specifically as a camera—was a marvel of ingenuity, incredibly advanced for its time: all metal, with an f3.7 lens! Over the years, the Voigtlander spirit of innovation continued with the first scientifically computed lens and the first miniature camera.

Now Voigtlander is back,

combining its unmatched engineering know-how with the largest, most modern production facilities anywhere in the world. The result is an array of fine camera products, superbly designed and engineered, yet brought to you at refreshingly moderate prices!

The all-new VSL 35mm System

Seldom is a camera maker able to introduce a complete new system, ready and available, all at once. Yet, that is exactly what is awaiting you at your camera dealer, from Voigtlander. And not just a camera and a few accessories. A Voigtlander **System**, encompassing two 35mm SLR cameras—your choice of match-needle metering or full electronic automation—an array of the finest optics the world has to offer, and a complete selection of system accessories.

The Voigtlander VSL-2 is a brand new automatic with the accuracy of electronic automation. Set the lens. Automatically, the electronically-controlled shutter, stepless from 4 seconds through 1/1000, adjusts itself for correct exposure. Green and red LED indicators in the finder keep you fully informed. All these and many more features are standard in the VSL-2, and priced far below any other, comparably equipped automatic. In the Voigtlander VSL-1, you can enjoy many of the

same features, with match-needle exposure control. The VSL-1, like the automatic VSL-2 accepts the same great Voigtlander lenses, 25mm through 200mm... with more to come. These very special optics are fully multi-coated. Their resolution, contrast and overall quality compare with the finest optics in photography, regardless of price. They all offer full-aperture viewing and metering, and are surprisingly light and compact. Bayonet mounts permit instant interchange. There is also a complete system of other accessories, including automatic extension tubes and bellows, even a microscope adapter.

Compact full-frame 35

A full-frame 35 that's barely bigger than a pack of cigarettes, the Voigtlander VF-101 is two cameras in one: A precision pocket camera for the serious photographer. And a significant step up for the snapshotter who's looking for more versatility and better picture quality. It offers the sharpness of a 40mm f2.8 Voigtlander multi-coated lens, with rangefinder focusing. The simplicity of aperture-preferred automation



with an electronically controlled shutter and stepless speeds from 4 seconds through 1/500th! Full information finder, rapid loading system—it packs a lot of features into a little camera, at a very modest price!

Four advanced electronic flashes

They bear the unmistakable mark of Voigtlander quality, combined with a complete selection of modern features... simply choose the facilities and the output that you need. The computerized model VC21B is the ideal always-ready unit for pocket or camera bag, gets a lot of light and a lot of flashes (up to 200) from two penlite batteries. Or pick the VC31S or VC38S with their rechargeable nicad batteries and dual aperture automation. Or opt

for the high output and electrical economy of the thyristorized V38RES. All have features such as a one-piece hot shoe and a unique UV filter for automatic color correction.

The Voigtlanders are here now, with the promise of even more to come. The key word for every Voigtlander product is value. Talk to your dealer and ask to see Voigtlander... you'll see what we mean. Or write for Lit/Pak P90. Ehrenreich Photo-Optical Industries, Inc., Woodbury, N.Y. 11797. 



GUIDE LINES

PAUL R. FARBER

THE ART OF THE FINE PRINT



□ In a previous column (see April, 1975 issue) I wrote that Fred Picker's book, titled *Zone VI Workshop*, was one of the clearest, most easy to read and apply explanations of the Zone System that I ever encountered. That observation still stands. The book has become a classic in its own time, and it is used as a standard reference text in schools, workshops and darkrooms all over the country.

Now, after publication of his first book, Picker has recently published his second book, *The Fine Print* (Amphoto), a collection of 75 superb duotone lithographs, each of which stands as a glowing tribute to the Zone System of exposure and development and to Picker's photographic artistry.

Actually, the book could be titled *The Son of Zone VI Workshop* because it is a logical extension of the original book in which Picker so clearly explains the ins and outs of the Zone System. In this book there is an explanation of how the Zone System works (minimal, to be sure, because the first book is so detailed), what the Zone System is and how one uses normal, expanded and contracted development times to achieve the desired, predictable end results. Also, some small gaps in the first book are filled in for the reader.

For example, I mentioned that the book refers to expanded, or plus development, and contracted, or minus development. Picker explains how extended development is used to place values higher up on the scale to separate tones and maximize textural renditions in subjects that are of lower than normal contrast. Guidelines are given as starting points, and Picker advises that the usual increase in development to raise a Zone VII value to Zone VIII would be on the order of 35 to 50 percent. Of course, the test procedure for determining a Zone VIII value must be observed if totally predictable results are to be achieved. The test procedure is clearly outlined in the *Zone VI Workshop*.

Next, Picker goes into contracted or minus development, which is used for subjects of higher than normal contrast to reduce contrast and minimize texture.

In all, the book is as easy to read and understand as the original effort. But this time, one has the added advantage of being able to see exactly how fine prints really look, and this makes it easier to visualize the results that can be obtained.



Fred Picker's new book, *The Fine Print*, is more than a collection of superb photographs. It's almost a complete course in photography.

The reader is treated to page after page of beautiful duotone images. The true fun of the book, for me, was the accompanying text for each picture. It was like being in Picker's head, seeing what he saw, thinking what he thought, exposing and developing and printing as he did. In the end it was like being the sole member of a workshop in which one could listen, see and understand everything. Private instruction couldn't be better.

For example, on page 24 of the book, there is a photograph titled "Gaspé, 1972." It is a rich looking print of "flowing shapes, lines, textures, and above all else, the glow of light..." It is indeed. We see how Picker approaches his subject and places his camera. The rationale for such placement occupies most of the descriptive paragraph. Then we go through the metering exercise, seeing how each zone is represented as a value and how the values represented constitute a normal scene demanding normal development.

We are told that Kodak's Tri-X Film was exposed for 1/50 at f/32 and how the original print was made on Varigam, using a No. 2 filter, without manipulation of any kind. The values that were metered fit exactly onto the paper, as Picker knew they would. The print created for the book was made using DuPont's Varilour and was exposed through a Polycontrast No. 2½ filter. And then we are treated to a little piece

of business that can be tucked away for future reference. Picker tells us that in order to cool the somewhat brown tone of Varilour, he added a bit of benzotriazole (Kodak Anti-Fog No. 1) to his Dektol developer. Why did he do this? Because when it came time to make the print for the book, the original Varigam he used was no longer available. The use of the antifog gave him the comparative result he wanted on another type of paper.

Although there are 74 other photographs in the book, many of them with complex lighting setups, camera angles and exposure and development techniques, not to mention printing techniques, I found the Gaspé photograph to be extremely interesting from another point of view. On page 153 of the book there is a dramatic, if not emotional appeal made for the use of cold-light enlarging sources as opposed to condenser systems. The original Gaspé negative was printed through both a cold-light enlarger and a condenser enlarger; the prints were then compared to a contact print. If the prints are accurate, and I see no reason to doubt Picker, the cold-light enlargement is virtually identical to the contact print, whereas the condenser enlargement shows evidence of blocking in the high-lights. The controversy surrounding these two types of enlarging light sources has had enough press, both good and bad. But the use of cold-light enlarging sources for Picker's exquisite prints can only confirm his faith in the system.

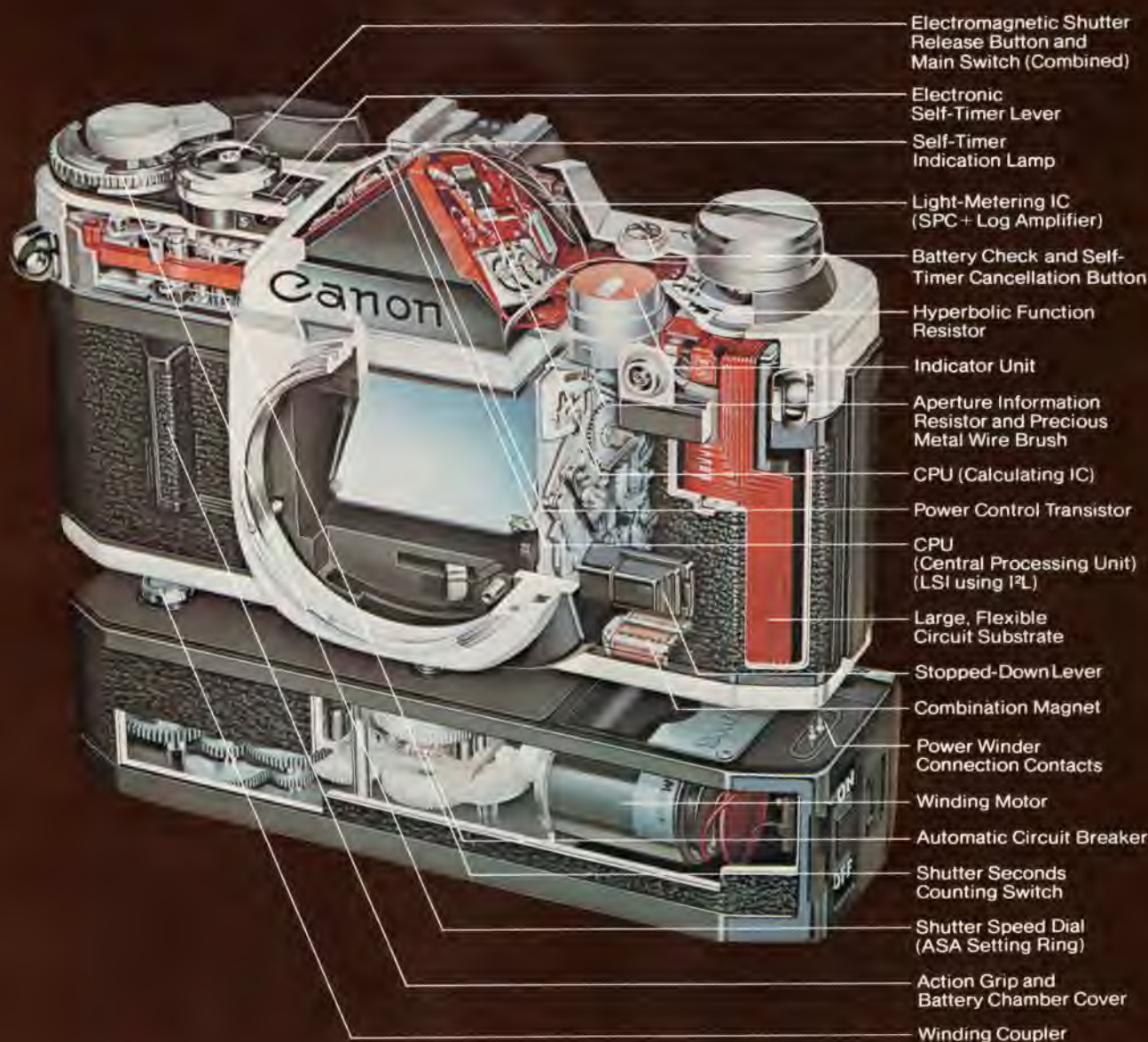
Finally, Picker goes into descriptive commentary about such things as cameras, meters, tripods, lenses, enlargers, enlarger characteristics, darkrooms, filing systems and films, papers and developers. The book's index is broken down for references to various techniques such as camera adjustments, cameras, exposure, film, filters, focusing, lenses, light, meters, position, photographers, rendition, record keeping, scale, shutters, subjects, tripods, agitation, contrast, developers, grain, resolution, additives, contrast, cropping, printing controls and so much more that it's impossible to give you the full details in this short space.

If you're interested in owning a copy of this fine book for yourself or you would like to give it to a fellow photographer, write to Zone VI Studios, Route 1, Putney, Vermont 05346. The price, including tax and postage, is a most reasonable \$12.50. □

A new generation.



The electronic system camera that's changing the course of photography.



Canon[®]
AE-1



To say that a camera is changing the course of photography is to invite natural skepticism. After all, new cameras are constantly being developed. What is it that makes the AE-1 really different?

First, the technology that goes in to making the AE-1 permits, for the first time, a level of performance sophistication never before achieved—and currently unmatched—in a camera in the AE-1's price range. Quite simply, it offers more for less, a rare combination in this day and age.

This combination of technical superiority and cost economy was achieved through Canon's exhaustive research into new production techniques, specifically CPU, LSI and I²L technology.

The CPU is the AE-1's "brain" that reads and interprets sensory input and analyzes this input for distribution of further information to the control sections of the AE-1 electronic system.

LSI—large-scale integration—is the extensive use of electronic integrated circuits in the AE-1, to the extent that it contains 20% fewer mechanical parts than conventional SLR's, and so is lighter in weight, smaller and more dependable than its peers.

I²L technology makes the CPU possible, because it permits super miniaturization of integrated circuitry. An I²L integrated circuit chip can process ten times the amount of information as a conventional same-size IC chip. Until I²L came along, it was just impossible to conceive of something as sophisticated as the AE-1's CPU going into an electronic camera.

THE CHANGE

The technology that goes into the AE-1's production is very interesting, even if you're not an engineer, but what about "changing the course of photography"? The first way in which the AE-1 is changing the course of photography is in changing the way cameras are made. They will be, following the AE-1's lead, smaller, more versatile, more sophisticated, more dependable and less costly. In short, the AE-1 is enabling the vast majority of photographers to afford performance that, using yesterday's production techniques, was unaffordable for many.

And, because automatic exposure electronic photography has been made accessible through the AE-1's introduction, the AE-1 is changing the course of photography in a second, even more profound way—it is emphatically ushering in the age of the automatic SLR as it has not been done before.



A NEW STYLE OF PHOTOGRAPHY

Today's photography is different from yesterday's. It has its roots in photojournalism, the spontaneous depiction of life as it happens. In his quest for real meaning in his photography, today's photographer places high emphasis on the ability of his camera to respond quickly and precisely. "Precisely" is the key here, because no one wants to sacrifice total technical quality for spontaneity. When you see just what the AE-1 can do, and how well it can do it, you'll see that it incorporates the best of the world of action and the best of the world of the precise photo-technician, and it does this with an ease that's astounding.

USING THE AE-1

Canon designed the AE-1 for everyone wanting a camera that is ready to

shoot at a moment's notice. To do this, the AE-1 has to be simple to operate in an absolute sense. To make an exposure, the user only has to set the ASA, set the shutter speed, focus and shoot. Inside the AE-1, the silicon photo cell is activated as the shutter release is initially depressed. Light quantity is instantly measured. The ASA setting and shutter speed (as well as the lens maximum aperture) are "considered" by the CPU, which then decides the proper aperture. All this happens in well under 50 milliseconds. The AE-1's response is, for all practical purposes, instantaneous.



Not only is the AE-1 easy to use for any photographer, but it is as well thought out as possible. The focusing system is particularly good, with an extremely bright microprism/split image/matte screen and an enlarged mirror, which prevents cutoff even when using lenses as long as the FD 400mm f/4.5 S.S.C.

Since the AE-1's meter sensitivity is center weighted, it is ideal in most lighting situations, but in the most extreme backlight, a switch under the left thumb gives an instant increase of 1.5 f-stops. Next to this switch is another



main switch, which can be used to preview exposure information in the finder, as an alternative to partial depression of the shutter release.

One very important feature of the AE-1 is its energy-saving circuitry. Normally, the life of the 6V silver oxide cell used in electronic cameras is rather short, because of the great power demands made on it. In the AE-1, sequential circuit operation and special energy-saving combination magnet design give the AE-1 owner at least one full year of use under normal climatic and exposure conditions.

THE SUPER SYSTEM

The AE-1 wasn't designed in a vacuum. It was intended to be the main component of an electronic system, including the Power Winder A, Speedlite 155A and related accessories.

The Power Winder A isn't just a winder, it's a true motor drive. Because much of the governing electronics for it are in the AE-1 body, it is quite simple.

With the Power Winder A,



the AE-1's film is advanced and shutter cocked after each exposure. At speeds above 1/60 sec., when the shutter release is held in the depressed position, the Power Winder A will cycle at a rate of nearly 2 fps, for true sequence action photography.

With the Power Winder A operating in conjunction with the self-timer and a cable release, completely automatic operation of the camera is possible—the camera can shoot photographs automatically, by itself, once every ten seconds when the self-timer is "charged," the shutter is locked and the motor is "on." This is excellent for candid photography, or for use at sporting events or where manned photography is difficult or impossible.

As a finishing touch, the Power Winder A incorporates an LED warning that tells not only when the battery power is low, but also when the end of the roll has been reached. The Power Winder A is more than an accessory to the AE-1. With it, the AE-1 can realize its full potential as an instant-response photographic instrument. And because of its simplicity, the Power Winder A follows the AE-1 in that it brings this feature within the grasp of almost every photographer.

Like the Power Winder A, the Speedlite 155A is part of the total AE-1 system package. It is a flash for photographers who hate to use flash, pro or



amateur. Not only does it "tell" the AE-1 what aperture (choice of either f/2.8 or f/5.6 at ASA 100) to use, but it will (when the ready light is on) automatically set the shutter speed of the AE-1 to 1/60 sec. No matter what the speed set on the AE-1's shutter speed dial. Should you make an exposure before the ready light is on, the camera reverts to the automatic exposure mode. Either way, you get a correct exposure.

The Speedlite 155A is different in other ways, too. Its sensor matches the center weighted sensitivity pattern of the AE-1's meter. So that should you want to shoot contrasty subjects with flash, an integrated reading is obtained, and your exposure will be much more accurate than with ordinary auto electronic flash units.

Because the Speedlite 155A has thyristor circuitry, it recycles very quickly (and prolongs battery life) at close shooting distances. So quickly in fact that it is possible for the flash to keep up with the Power Winder A at almost 2 fps.

FINISHING TOUCHES

The list of what the AE-1 can do and its features is quite extensive. Its obvious advantages you'll appreciate immediately, but some of the others are so subtle that you may not appreciate them until you've really put the camera through its paces.

In terms of human engineering, the AE-1 is a small masterpiece. The battery cover serves as an action grip for the right hand. The shutter release is large

and very smooth. All numerals on the camera are exceptionally legible. The shutter speed dial is serrated and can be turned by one finger. The film advance lever has a very short, positive throw and even serves as a rapid winder of sorts, because you can keep one finger on the shutter release and each time you wind the advance lever, a shot will be fired.

Special attention was paid to keeping the AE-1, as nearly as possible, an "any climate" camera. It is very well sealed against water and dirt. Even the contacts between motor and body are protected by a small gasket to keep out contaminants.

Nothing about the AE-1 suffers from over-miniaturization. The viewing system is designed in, not crammed in, so that it's truly comfortable to use and doesn't make viewing equivalent to sitting too close to the screen at the movies. It is the ideal blend of brightness and focusing accuracy.

A NEW DIRECTION

The AE-1 is a camera that others will try to follow. And, it's a camera that will not only introduce a lot of photographers to the world of versatile (the AE-1 accepts all FD Canon lenses for AE operation and many Canon accessories) yet easy and economical photography, but will change many photographers' minds about the worthiness of automatic exposure photog-



phy. It matters little whether an exposure is derived manually or automatically, except where it counts—the image. We bring you the AE-1 with this goal foremost in mind. In photography, images are everything, and nothing can help you make them like the Canon AE-1.

This ad can only give you a small idea of what the AE-1 represents, and what it has to offer. To get the whole story, see your local Canon dealer soon. Or write: Dept. AE-1, Canon U.S.A., Inc., 10 Nevada Drive, Lake Success, N.Y. 11040.

Canon® AE-1

GAMERA ON CAMPUS

ROBERT ROUTH

PHOTOJOURNALISM— A LIVING EXPERIENCE



□ I recently completed an 11,000-mile, 14-week tour around the United States, visiting the photo departments of many universities, colleges and high schools. It was at the universities and colleges that I was sucked into one of the most insidious con games of all, that of relating the success of the photography program to the ivy on the wall!

In retrospect, the obvious finally revealed itself: The quality of photography programs is not related to the institution—no matter how prestigious—but rather to the driving force of its instructors. Once I overcame this mental block, it became perfectly obvious that excellent teachers could exist in such an unlikely place as the daily newspaper. And that is exactly where the subject of this month's column guided such illustrious students as Brian Lanker, two-time awardee of the Newspaper Photographer of the Year and 1973 Pulitzer Prize winner, Gary Settle of the *New York Times*, Perry Riddle of the *Chicago Daily News*, Dave Harvey and Bill Snead of *National Geographic*. They all studied under Rich Clarkson, Director of Photography of the *Topeka Capital-Journal* since 1958.

Clarkson is the immediate past president of the National Press Photographers Association, Inc., a position he served with such distinction that he is credited with bringing professionalism to the organization. He is an organized, pushing, driving perfectionist who acts as a catalyst to those fortunate enough to participate in his on-the-job training program, which has turned out a remarkable group of photojournalists.

It's a temptation to talk on and on about the credits of this man who was cited in 1976 by his peers in the NPPA as a major leader in photography, but in the short space of one page, I want to reserve room for his ideas on the education of the photojournalist.

Clarkson believes that one of the best ways to teach photojournalism is through practice and that a laboratory situation which involves hands-on experience and quick critiques is the fastest and most practical way of teaching. He comments, "To me, the best way of

accomplishing these goals is on a daily newspaper. Every day starts fresh, every day has new challenges, every day has slightly different sets of circumstances and different things going on."

He believes that a city newspaper offers a far better opportunity than a campus newspaper, except in those instances where the campus newspaper covers the events of the city or community in which it is located. Practical



Rich Clarkson, Director of Photography, *Topeka Capital-Journal*, Topeka, Kansas.

experience must be coupled with regular discussions about what took place, what editorial decisions had to be made by the photographer, his or her understanding of the various ways to go with each assignment or each picture situation as it develops. This combination of doing, discussing and critiquing makes up the best kind of teaching.

In considering the qualities that make a good photojournalist, Clarkson lists, "...curiosity, a fair degree of intelligence and great amounts of natural ability. When I say 'natural ability' I think of the ability to see things visually and graphically, of having a sense of timing and a sense of 'moment' (photographs that have great moments in them, that are revealing and sensitive or perhaps quite hilarious or quite sad) and of having journalistic quality (an ability to think of ways to capitalize on an event through the photograph so that it's very publishable). If you have very little natural ability, then another quality that a good photojournalist needs is the willingness to work hard. Finally, I think that any successful photographer, in some way or other, has to have a bit of pride in his work, which sometimes takes the form of ego. Ego is a very good quality if it is properly channeled and properly used. Someone who's in control of his or her own ego

can use it very well and not have other people resent it."

Clarkson does not think many schools are doing an adequate job in teaching photojournalism because "...it's a difficult situation in which you have to combine a lot of elements—good teachers, good labs and a competent daily newspaper that covers the city."

Clarkson's ideas on equipment are most interesting. He points out, "Many students start out with the ultimate in equipment. Generally, it is difficult for someone to learn with that much equipment." He suggests that perhaps one camera body and a couple of lenses would be sufficient to start with so that the student would not be restricted by or tied down to the logistics of equipment. Clarkson continues, "I think someone starting should want a piece of equipment so badly that he or she can taste it. And then when they can afford it or decide that they are ready for it, they know exactly what they need it for and what to do with it."

On the future of photojournalism, Clarkson feels, "The art is in a constant state of development. What has changed within the past years has been the impact of television, the loss of some of the major general circulation magazines, such as *Life* and *Look*, and the emergence of daily newspapers—particularly community newspapers—throughout the country as great users of photojournalism. There are more photographers by far at work today in newspapers around the country than at any time in our history; there are more photographers working for magazines (the trend is toward the specialty magazine); there are more photographs being published. When you look at it in a broad sense, there's more going on in photojournalism today than at any other time—and not just a little bit but a lot. There's a trend for really 'meaty' picture stories that goes hand in hand with the younger generation's interest in photography and in expressing themselves visually. I might add one thing at this point—young people have a sense of making pictures for themselves. Something that has to be taught very early is that photojournalism is not dealing with yourself, your personal satisfaction or your ego. Essentially, you are making pictures for the viewer/reader. Photographers who understand this move ahead very fast."

Rich Clarkson believes strongly in the value of the NPPA, which currently has a student membership between 800 and 900 and a regular membership including the majority of photojournalism instructors. For membership information write: Mr. Charles Cooper, Box 1146, Durham, North Carolina 27702. □

CLUB CLOSE-UPS

JOAN YARFITZ

PHOTOGRAPHY IS COMMUNICATION



□ Almost a year ago, I devoted a column to a most unique photo organization, the Volunteer Service Photographers, Inc., a group of photographers whose members pursue photography as a means of therapy (see November, 1975 "Club Close-Ups"). The VSP sponsors more than 50 rehabilitation photography programs throughout New York City, teaching photo skills to the hospitalized, handicapped, senior citizens, disadvantaged youth, ex-offenders and drug addicts. The success of the 35-year-old program has been phenomenal, providing outlets for creative expression to thousands of men, woman and youngsters. The reader response to that column was exceptional; I received tens of letters from people wanting to know how they could contribute to the group, wanting to know more about the workings of the VSP, inquiring how to begin similar public service ventures in their communities.

Recently, the VSP held its annual Student Contest Showing in Manhattan; the exhibit represented the top judges' choices selected from 274 entries submitted by 173 students/patients from 32 VSP programs throughout the greater New York metropolitan area.

The sponsors and judges of the event thought the exhibition results worthy of publication and forwarded a portfolio of some of the winning photographs to PhotoGraphic for editorial consideration. We agreed that the photos were worthy of publication and decided that this column would display the efforts of this dedicated group of photographers.

It then occurred to me that one of the most important camera club functions is the exhibition of prize-winning prints but that, for the most part, the viewing and appreciation of these works of artistic expression and technical excellence are usually reserved for club members and the local community. But works of art in any medium must be shared by more than just a few to really be appreciated and deserving of critical acclaim (positive or negative). It was with this thought in mind that I decided to invite clubs to share what they consider portfolios of technical and artistic

excellence with other clubs throughout the world.

Once or twice a year, the best portfolios submitted by camera clubs will be published here. If you're interested, please send *no more than 15 black-and-white prints (include technical information and special techniques used)* to Camera Club Editor, c/o Petersen's PhotoGraphic Magazine, 8490 Sunset Blvd., Los Angeles, California 90069. Please package all material carefully and *include return mailers and sufficient postage* to insure the safe return of material. Submissions will be kept for approximately four to six months, so be

sure to duplicate your material so that you have it on hand.

After the publication of a portfolio, these pages will become a forum for the opinions and critical judgments of other viewer/photographers, who will, no doubt, have valuable commentary and suggestions concerning the published work. All ideas will be welcomed, considered and published when appropriate. In this way, a unique channel of communication and vehicle for the interchange of ideas will be opened to all club members and photographers. After all, isn't communication what photography's all about? □



1. Bill Efinger won First Grand Prize and the Grace F. Lamb Trophy for best black-and-white photo.

2. Twelve-year old Stan Stanton used a Pentax Spotmatic to capture this Second Grand Prize-winning print.

3. Conrad DeLeon, Jr., used a Nikon F to photograph the images for this photo montage, which won Third Grand Prize.

4. James Cuebas, 17, used a Topcon to capture this shot, which won First Grand Prize and the Peter Cup.

5. J. Maralo took Second Grand Prize with this shot taken with a Konica T3.

Camera clubs please note: "Contest News" can be found on page 128.

Join a Camera Club: Just send a self-addressed, stamped envelope, along with a list of nearby zip-codes to Camera Club Editor, c/o Petersen's PhotoGraphic Magazine, 8490 Sunset Blvd., Los Angeles, California 90069.

**World's smallest
35mm precision
camera!**



Camera shown actual size

35mm cameras were originally intended to be light, compact, easy to carry, a joy to handle. But some have grown to be giants weighing two pounds and more! Rollei reverses the trend...with a full-frame precision 35 that's *smaller* than any other high-precision 35. Almost everything is ultra-modern; a fantastically sharp, multi-coated five element Sonnar f/2.8 lens, shutter speeds up to 1/500, coupled CdS match-needle

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SELF-ASSIGNMENT

BEN HELPRIN

A FLY ON THE STARBOARD RAIL



□ Last month in this column I reprinted Fred Picker's letter which questioned the validity of the developing-time test procedure detailed in the April and May 1976 "Self-Assignment"

columns. The letter raised some interesting points which I'll answer now.

The method I described for determining correct empirical developing times is a classic one based upon Ansel Adams' original procedure. The test utilizes preassigned Zone VI negative density aim-point values (0.90 for a condenser enlarger and 1.10 for a diffusion enlarger) to determine the correct developing time needed to produce a negative of optimum contrast. Mr. Picker objects to this method because he believes that print contrast variations, resulting from differences in equipment and materials (i.e., different condenser enlargers, enlarging lenses, printing papers, developers, water chemistry, etc.), make any predetermined negative density values arbitrary and impractical.

I disagree with this conclusion for a number of reasons. To begin with, the factors mentioned by Mr. Picker *do* affect print contrast but not to the extent he has stated. I do not believe their influence is great enough to invalidate the testing procedure. Let's examine them one by one.

Enlarging Lenses: At California State University, Los Angeles, in conjunction with ordering equipment for new dark-room facilities, we conducted tests on 12 different makes of enlarging lenses. The lenses tested ranged in price from approximately \$25 to \$150. Considering the price differential, the less expensive lenses performed remarkably well. There were differences in the images produced by the cheaper compared to the more expensive lenses, but these differences were mainly related to sharpness, resolution and color correction—not to contrast. None of the prints produced by the various lenses exhibited a significant difference in contrast.

In the past, only the more expensive enlarging lenses were coated. Perhaps the contrast variance of one full paper

grade mentioned by Mr. Picker would have been affected by a coated versus an uncoated lens. All modern enlarging lenses are now coated. Consequently, their contrast variance is not great enough to significantly affect the developing-time test.

Condenser Enlargers: Different makes of condenser enlargers do produce a variance in print contrast. How great is this variance? I supplied a number of my students, each of whom owns and uses a different make of condenser enlarger, with a test negative. The nega-



The developing-time period has an important effect upon the final contrast of the negative. Therefore, this phase of the developing process must be carefully timed. ©Ben Helprin.

tive contained a full tonal-scale scene and a gray scale. Each student was able to produce a tonally correct print and a proper reproduction of the gray scale using either a No. 2 or a 2½ Kodak Polycontrast filter and Polycontrast paper. This minor contrast variance, when evaluated on a practical basis, does not warrant a change in the assigned optimum-density values of the developing-time test.

Additional Factors: Differences in print developers, enlarging papers, water chemistry, etc., will also have a slight influence upon the contrast of the final print. Again, when evaluated on a practical rather than a theoretical basis, my experience has shown that their effect is not significant enough to warrant a change in the testing procedure. Why? Because contrast variations resulting from the previously mentioned differences in equipment and materials are minuscule in comparison to the contrast variance resulting from a change in the film's developing-time period. The test is designed to deal with this major aspect of film contrast within reasonable limits of accuracy.

Accuracy: George Stimson, one of the finest photographic technicians in the business, made a very cogent statement concerning the practical aspects of accuracy in applied photography. "The

trouble with many photographers who become deeply involved with technique, especially those who aren't working commercially in photography," Stimson said, "is that they tend to lose their sense of proportion. It's as if a captain who's responsible for the weight distribution of cargo on a gigantic freighter started to worry about the effect of a fly landing on the port or starboard side of the ship. I'm meticulous, yes, but I also have to draw the line at a reasonable point. Otherwise, I'd never get the job done."

Where does one draw the line? What degree of accuracy is required for a developing-time test? The answers to these questions are dependent upon both the problem to be solved and the group for whom the test is designed.

The most prevalent problem encountered by beginning photography students and, for that matter, by a surprising number of otherwise advanced amateurs, is that many of their negatives exhibit an inappropriate contrast range. These negatives, due to improper exposure or developing time, or to a combination of both of these factors, are incapable of being used to produce a fine print. The complex burning-in, dodging and other print manipulations required to make even a barely acceptable print from such a negative are frustrating, discouraging and often far beyond the technical capability of the average photographer.

I wanted a test that would solve this specific problem for this particular group. The test had to be simple and practical enough to be performed by the vast majority of photographers, not just by extremely advanced technicians. To achieve these goals, I chose to draw the line at what I considered to be a practical point of accuracy. Within this limitation the test works and works well. In the past four years over 500 basic and advanced photography students have successfully used the simplified exposure-index and developing-time tests detailed in previous "Self-Assignments" to produce fine, easily printable negatives.

The excellent negatives and prints produced by the students indicate that Mr. Picker's objections, though theoretically correct, are not necessarily applicable on a practical basis. I do, however, emphatically agree with one point made by Mr. Picker. The true proof of any negative is in the printing. No matter what type of test is used to determine a correct empirical developing time, the resultant negative must be capable of producing an excellent print. Either test will certainly bring you very close to the mark. Subsequent printing of a negative containing a full tonal-range scene or a gray scale should indicate what slight adjustments, if any, are needed. □



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Beseler 23C.**

**The 1976
Beseler 23C.**

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consider the 23C seriously as the best enlarger investment you can make for your darkroom. Who knows? In 1996, your 23C may still be the top enlarger around. Write to us for all the details on the 23C.

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IN JUST SECONDS

JOE NOVAK

CATS AND BATS



□ You know what comes this month—Halloween. It's my favorite day of the year and an excellent opportunity for you to line up little rows of colorful candy pumpkins, witches, cats,

bats, rats and owls, to get out your Kodak EK-6 and Polaroid SX-70 cameras and make your own little color test report. That way, you can have your bats and eat them, too. And when the frost is on the pumpkin, you can take comfort in the fact that your new SX-70 film works well at temperatures as low as 45°F.

Speaking of rats and bats, Jon Holmes, Polaroid's publicity director, was talking with me the other day about the long-term insidious effects of various commercial products. You know—the people who used to paint the hands of clocks with luminous radioactive substances and who licked their brushes to a fine point tended to lose their hair, or those who sit too close to their color television sets tend to lose something else—these are the kinds of things I mean. Well, we tried to find some common quality in all the people we knew who used the SX-70 camera very frequently, and we decided that they did indeed share a rather striking characteristic: They seemed to be a bit crazy. Realizing the gravity of this discovery, I promised Jon that I would not let the information find its way into any large-circulation magazines, lest yet another corporation be brought to its knees, and both of us be out of work.

One could have found strong support for our theory at the gala press conference conducted by Polaroid during the winter to introduce its *el cheapo* Pronto! to the civilized world. It was held at New York's plush Plaza Hotel, and in the Grand Ballroom at that. It was clear that Polaroid *really* meant business this time, as the location contrasted greatly with the lunchroom of the local science museum that was used to launch Polacolor 2 Film.

Maybe it was the champagne. Maybe it was the excitement of the day, but one photo writer, whose name I won't mention here, did something quite strange. Seeing me photographing a friend with my SX-70, he snatched the emerging print from the jaws of my

camera and hurled it viciously to the floor. Then he stomped on it. It was like a scene from *The Wild Angels*. He



The shape of things to come?

was, he explained, making a "manipulated" print. He assured me that he had nothing against either my friend or myself, but we still gave him a wide berth for the remainder of the afternoon. A famous photography critic was observed embracing a mannequin. I still haven't figured out who provided the mannequins or why. Unfortunately, the photograph I made of him is useless for purposes of blackmail. Alas, he has one of me doing the same thing. Such was the emotion of the day, but it does serve to illustrate my point.

And what did all of these distinguished technical journalists say to each other about the new Polaroid camera? Did they remark about the three-element, fully-coated and corrected f/9.4 plastic lens or the modular construction? Was talk of integrated circuits, Galilean viewfinders, self-timers and solenoids filling the air between sips of champagne? Well, maybe just a little. The black polyester curtain that darts out of the camera with the picture attracted a lot of comment. It's certainly *my* favorite feature in the Pronto!. You cradle the beast in the palm of your hand like a big toad, push the red button, and with a low grinding grunt it flits its tongue. Lovable little machine. Do you know why it has a tongue? No, it isn't for catching flies. The Mylar-covered film unit pipes light back to the rear of the picture as it emerges from the camera. Briefly, it is vulnerable. Since the Pronto! lacks the long front baffle built into the folding SX-70 cameras, a device had to be created to momentarily shield the film from light. And if this device could tickle the user's fancy at the same time, so much the better.

Other writers were impressed with the fill-flash capability of the Pronto!. What a boost this would be to the flashbulb industry when large numbers of amateurs began to use flash outdoors and in full sunlight! Most observers felt that the Pronto! was much easier to handle than the folding models. Certainly, there would be no more ruined pictures as a result of fingers depressing the bellows. Finally, it was constructed of a material with which the average consumer could more readily identify—plastic. And all this for only \$66! What could we do but applaud?

But there were some of us who thought that the Pronto! had one mildly disturbing characteristic: It resembled a tank—Third Cambridge ABS Armored Division. Rumble, rumble. Recently I outfitted my Pronto! with a set of massive wheels, an aerial and a red "911" police emergency sticker. Then I let it rumble over me. So now you can see that I've been shooting way too much SX-70 myself. It wasn't easy to sacrifice myself for the good of the State, but I hope it will be an inspiration and example for all of you out there who feel that you, too, may be a little "different." Talk about paranoia. There are some of us who think that the Polaroid Hot Line is wiretapped!

The world *is* getting a little strange. How many of us would have guessed, even five years ago, that millions of people would come to use cameras like the Pronto!? Perhaps tomorrow will bring a world of pulsating colored crystal and omniscient microchips—a world in which your government will speak to you through your mandatory quartz watch/instrument bracelet and in which *everyone* will have the same inexpensive but very sophisticated imagemaking device! As much as I like them, I hope we never see the day when little hard pod pictures are the only kind we can have. For the moment, at least, we can sit back and enjoy our pocket calculators, digital watches and instant cameras, regarding them as friendly symbols of a beneficial technology. And we shall take care that this technology remains an extension of human will and not the other way around.

Ever made a picture of a lighted jack-o'-lantern grinning at you in the dark? Results with an SX-70 are just beautiful. If you haven't yet acquired an SX-70, then borrow one. Your Halloween parties will never be the same again. *Weird?* □

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- How to use filters to get the "right" colors in the "wrong" light
- Why "snow shadows" often appear blue and what you can do about it
- "Color temperature" — the vital tool often overlooked
- The psychological meaning of colors
- What every color photographer must know about weather
- Tips for taking pictures in the magic of early morning
- A simple rule that professionals use to get fantastic pictures in mist
- The secret of mastering artificial light
- "The pitfall of unwanted color" — the trap that trips even professionals
- How to photograph inanimate objects — and make them come alive!
- When, where and how to photograph animals and pets
- The meticulous art of shooting small flowers
- How to copy works of art in accurate color
- How photographer Ernst Haas uses color daringly
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FOGUS ON FILMMAKING

MARKENE KRUSE-SMITH

A CHANCE TO WIN FAME AND FORTUNE



□ Your favorite movie-making column will see a slight departure from the usual bill of fare this month to bring you news of an event that's sure to be of interest to amateur filmmakers everywhere, the **Picture America-In Motion®** movie contest. The nationwide competition is being sponsored by the Photo Marketing Association International (PMAI) in cooperation with photo industry suppliers. The contest encourages amateurs to compete for 76 national and regional prizes totaling \$5000. Interested? Here are the rules.

Any amateur or filmmaking team is eligible to enter the contest, which will be judged by the cinema department of a leading university (as this goes to press, Brooklyn College in New York is being considered). If a team enters, the prize is to be split among its members. For the purposes of the contest, an amateur is someone who does not earn income from filmmaking. Entries must be postmarked no later than December 31, 1976. Receipt of each entry will be acknowledged, and winners will be announced no later than July 4, 1977.

Participants may enter only one film, which can be super 8, single-8 or 8mm, sound or silent, color or black-and-white. Films may be from one to 10 minutes in length—about 15 to 150 feet. If the film is accompanied by a separate tape recording, a clear indication of the start and running time should be included. A two- to three-foot blank leader should be properly spliced at the start and end of each film.

There is no entry fee. Official entry forms are available from participating photo shops and photofinishers anywhere in the U.S. or from Picture America-In Motion, Box 5189, F.D.R. Station, New York, New York 10022. Films must deal with some aspect of America or American life. Each film must include in some way the Picture America-In Motion design. (The contest symbol is reproduced here—a super 8 camera facing right with stars in the handle and “76” in the lens.) This copyrighted symbol can be shot at the beginning or end of the film or incorporated in any size in any way into the film story.

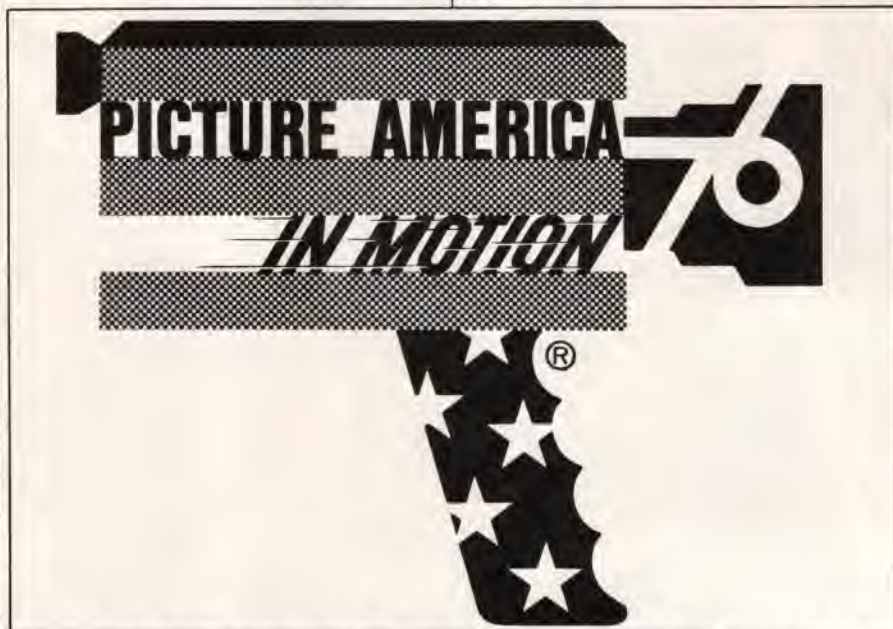
Films will be screened and judged on the basis of their A. ideas, B. technical

qualities and C. portrayal of some aspect of America or American life. All decisions of the judges will be final. Filmmakers will compete for regional awards only with other filmmakers living in their home photo section. Each of the 10 photo sections designated by PMAI includes about 10 percent of the U.S. population.

Films should be mailed first class in

prize \$30, third prize \$20. Total regional cash prize awards is \$2500. These regional prizes will be for the seven best films in each photo region.

Every film submitted will first compete for regional awards only against other filmmakers living in their home photo region. Then those films will compete for the national prizes. New regional awards will be made to replace



A total of \$5000 in cash prizes will be distributed among 76 lucky amateur filmmakers who use this logo in their movies.

an insured, protected package along with a completed official entry form. All entries must be accompanied by a self-addressed, stamped mailer for return of the film after the judging. Each film should be clearly marked with the filmmaker's name and home state on the leader at the beginning of the film. All films will be handled with care. However, the Photo Marketing Association International and cooperating organizations will not be responsible for loss or damage.

The PMAI Picture America-In Motion Contest Committee maintains the right to make and use publicity shots of the filmmakers, duplicates and enlarged stills from the winning films for their promotion, advertising, trade and public relations purposes.

Nationally, \$2500 will be awarded, with an additional \$2500 to be awarded regionally. A total of 76 awards will be made as follows: *National*—all-around best film, prize \$1000; sound films, first prize \$400, second prize \$300, third prize \$200; silent films, first prize \$350, second prize \$250. Total national cash prize awards is \$2500. (These national prizes will be for the six best films submitted, ranking higher than the regional awards.) *For each photo region*—sound films, first prize \$75, second prize \$50, third prize \$25, plus *honorable mention*—silent films, first prize \$50, second

the national winners. A film may receive only one award.

For entry forms and further information see your local participating photo dealer or write to Picture America-In Motion, Box 5189, F.D.R. Station, New York, New York 10022.

FOR THOSE MORE INTERESTED IN FAME THAN FORTUNE

Just what you've been waiting for—an opportunity to air your films on network TV. Here's a chance at the big-time for amateur filmmakers engaged in a labor of love who are interested in exposure for their work rather than in making money. The popular network comedy show, “NBC Saturday Night Live,” welcomes program contributions from viewers. Films submitted should be either super 8 or 16mm, sound or silent, black-and-white or color, and they must be under two minutes in length to be considered for possible inclusion in the show. Filmmakers will not be paid, but they will get credit for work selected to be included on the program. And what a thrill to get national exposure for your most precious pieces of celluloid! Send submissions to Neil Levy, c/o “Saturday Night Live,” Room 1722, NBC Television, 30 Rockefeller Plaza, New York, New York 10020. Be sure to enclose your name and return address along with your film to insure its safe return. □

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Whether you want an electronic or a match-needle SLR, Minolta gives you a wide range of models to choose from. With features to match your needs and budget.

Electronic Minoltas have smooth, quiet shutters that automatically adjust speeds up to the instant you shoot for unparalleled exposure accuracy. Three models, the professional XK, the deluxe XE-7 and the economical XE-5 let you select from a host of creative and convenience features such as interchangeable finders and focusing screens, speeds to 1/2000th of a second, multiple exposure capability and built-in hot shoe.

Minolta SR-T cameras offer a broad range of features at remarkably low prices. All have match-needle exposure adjustment, shutter speeds to 1/1000th of a second and Minolta's traditional human engineering for fast, effortless handling. Multiple exposure capability, built-in hot shoe, self-timer, memo holder and film safe load signal are among the feature choices available with the SR-T 202, SR-T 201 and SR-T 200.

Whichever Minolta you choose will help you make the transition from creative vision to captured image as quickly and easily as possible. That's what Minolta handling is all about. And why you and a Minolta soon become inseparable.

For more information about Minolta 35mm SLR cameras, write Minolta Corporation, 101 Williams Drive, Ramsey, New Jersey 07446. In Canada: Anglophoto, Ltd., P.O.



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sun, the sun sets from Nikon.



All day long, the sun traces a lazy arc across the sky. Then, at sunset, when the lighting is often at its most photogenic, the insolent star seems to double its speed, in a headlong race to reach the horizon. The light you've been waiting for is there, but it seems to change character by the second. In hue, and direction . . . and especially intensity. The needle you matched a moment ago is suddenly unmatched, but unnoticed. For you're feverishly working to capture the image in your mind's eye before the light disappears completely.

But there's a happy ending if you're using a Nikkormat EL. In the same situation, the Nikkormat EL's sophisticated electronic circuitry continuously changes exposure to match the light. It precisely selects a shutter speed anywhere from four seconds to 1/1000th. An integrated circuit only 2mm square, with a unique, Nikon-developed Functional Resistance Element, provides instantaneous reaction to changes in light. Plus shock resistance far exceeding others, which are mechanical systems.

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POINT SOURCE

STEVEN ROSENBAUM

DARKROOM DINOSAURS



□ There's a *dinosaur* in my darkroom! Not the honest-to-goodness, gigantic, fire-breathing relic of the Mesozoic era but a mammoth beast just the same. In fact, once upon a time during

the bygone photographic era known as B.S.N. (Before Small Negatives), these creatures of the dark, which were then referred to as "contact print boxes," resided in almost every photographer's darkroom. Varying in size from bulky to huge, these self-illuminated viewing/printing boxes contained a glass shelf support and a padded, hinged lid, which closed tightly to assure uniform contact of the photographic paper with the negatives.

Some contact print boxes contained many light bulbs and switches to regulate the amount of light passing through the negative at any point; others were simple by comparison, having only one or two light bulbs to provide even illumination. In either case the large sheet-film negatives (up to 8x10 inches) were ideally suited for contact printing, since they would reveal sufficient detail without the need for enlargement. These contact print boxes were bright creatures—they had to be in order to survive, since they lived primarily on a diet of contact-speed (slow) photographic paper. Even the dimmest of these darkroom dinosaurs provided enough illumination to fog every sheet of paper in every darkroom on your block.

If they were so bright, then why are they all but extinct? Experts may argue, but I believe their decline was merely the natural result of evolution—the same process that brought about the demise of their prehistoric ancestors.

As many photographers abandoned larger sheet-film negatives for the convenience of smaller roll-film sizes, they needed to rely much more upon enlargers in the darkroom. For viewing convenience a 35mm negative, with its approximate 1x1½-inch image size, routinely requires some degree of magnification or enlargement when printed. As a result, contact printing with small-format negatives is usually confined to making proof sheets. Enter—the contact print frame—a much more efficient and useful device for making proof sheets than the self-illuminated contact print box of the past.

As long as most modern darkrooms have enlargers, it makes good sense to use the enlarger as a controlled light



Hansa Contact Printer, described in the text, is shown here with some of the many other Hansa darkroom accessories ranging from a floating thermometer to chemical storage bottles which contain a waterproof cap-within-a-cap for labeling contents.

source for exposing proof sheets, along with a compact (not much larger than a 100-sheet box of photographic paper) and easily stored contact print frame. A contact print frame holds your negatives in firm contact with a piece of photographic paper, while the paper is given an exposure from the enlarger. When making a proof sheet in this way, there is no need for using a special contact-speed paper, since the enlarger's lens and timer, in combination, can be used to accurately regulate the exposure on even the fastest paper. In addition, your proof sheet can be made on the same paper you use to make your enlargements, and the proof sheet produced will not only be a handy guide for filing, cropping and editing negatives, it can also indicate approximate exposure times for enlargements.

To get this information from your proof sheet I suggest the following working procedure. With an empty negative carrier in place raise the enlarger so that it projects a beam of light slightly larger than 8x10 inches. Make your proof sheet on a normal grade of paper (No. 2 contrast grade or equivalent variable contrast). If you normally print on a variable-contrast paper, be sure to include the appropriate filter in the light path. If you have no prior experience with approximate exposures for your equipment, set the enlarger

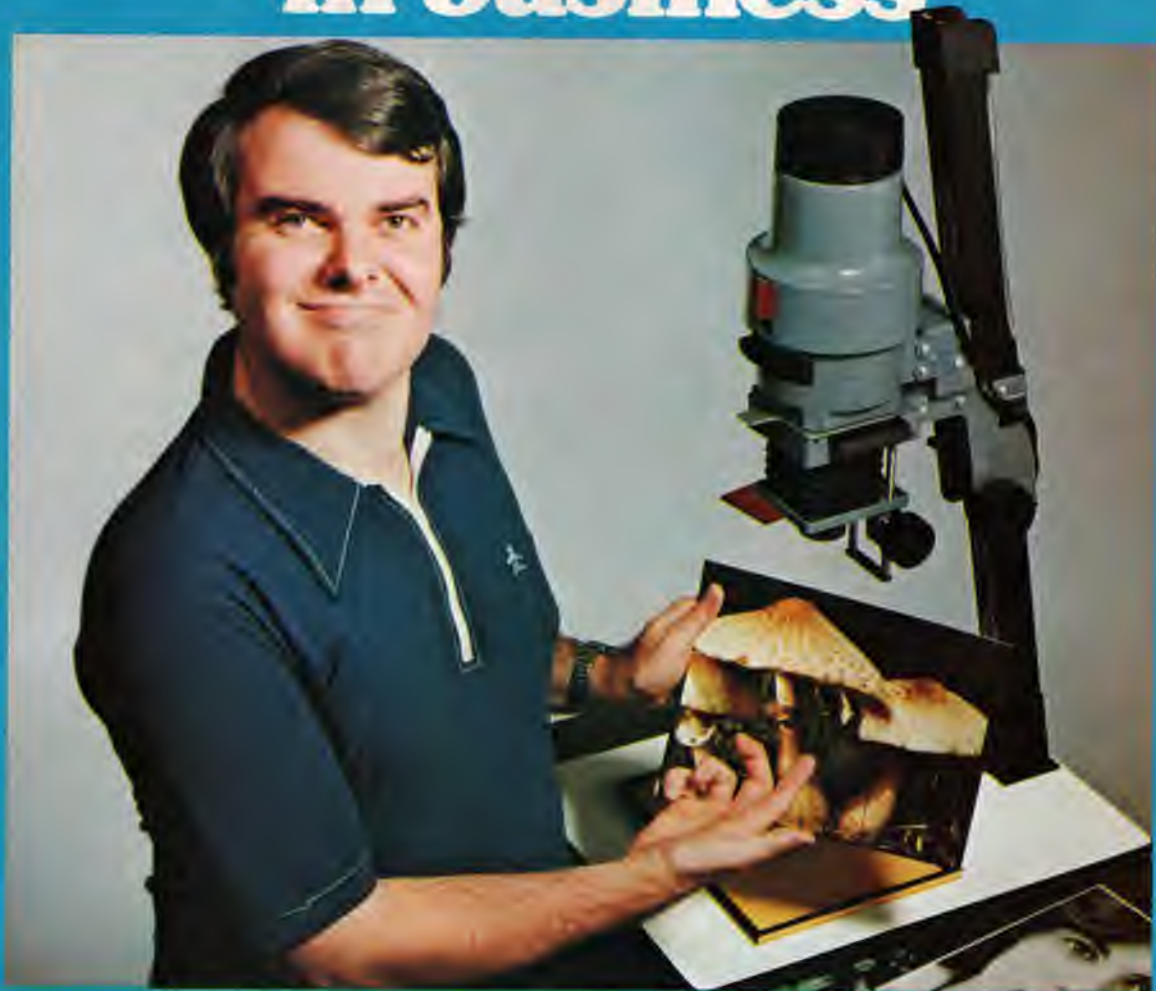
lens to f/8 and the timer to 10 seconds. Now expose the paper in the contact frame which has been placed on the baseboard. Process paper in normal paper processing solutions, allowing it to fully develop (approximately 1½ to 2 minutes). When the print is sufficiently fixed, turn on the room lights and evaluate the proof sheet.

If the overall sheet is too light, more exposure is necessary; if the sheet is too dark, less exposure is needed. A normally exposed proof sheet will probably show some frames too light and some frames too dark with the rest of the roll correct. Once you obtain such a proof sheet, simply transfer the negative you wish to enlarge from the contact frame to the negative carrier and make your exposure onto another piece of paper which has been placed in the easel on the enlarger's baseboard, without changing any of the settings that were used to make the satisfactory proof sheet. Thus any image that appeared correct on the proof sheet will produce a properly exposed enlargement, provided you don't change the settings. If you want to make other size enlargements or prints from frames which appeared too light or too dark on the proof sheet, it will be necessary to adjust your exposures accordingly.

There are many contact print frames to choose from, and you ought to spend a little time at your local photo supply dealer, who can help you select one that's right for your needs. One that I have found to be very convenient, especially when printing curly negatives is the Hansa Contact Printer. It is a well-designed, extremely functional piece of equipment whose claim to fame, as far as I'm concerned, is a feature best described as adjustable stainless steel "fingers" that hold the negative strips flat from both ends. This allows full support for the negatives, an unobstructed view of the entire film area and minimizes negative handling which can cause scratching. The Hansa line of darkroom equipment is imported to the U.S. by Elmo Mfg. Corp., 32-10 57th Street, Woodside, New York 11377.

In the meantime, I've got a problem—I still have a dinosaur in my darkroom. It's a contact print box that was given to me years ago, and silly as it sounds, we've been through a lot together. I know I should probably put it to pasture, but I just can't bring myself to do that—besides, do you know how big a pasture a dinosaur needs? □

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You can even make your System 600 a **copy camera and slide duplicator** by just adding the inexpensive copy attachment and mounting your 35mm SLR camera to the enlarger chassis. And with the Chromega color head you can creatively control color balance.

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The full-featured, professional-quality FR also accepts the same wide variety of components and accessories as the Contax system. From the Infrared remote

control system, to the data back, to the incredibly long and flexible cable switch.

So what's the difference between the Yashica FR and our Contax RTS? The FR is a semi-automatic camera. You select the shutter speed and aperture using an LED equipped, full information viewfinder.

But the biggest difference? The Yashica FR costs far less than the Contax RTS. To find out exactly how much less, talk to your Yashica dealer. Or for literature write: Yashica Inc., 411 Sette Drive, Paramus, N.J. 07652. In Canada: Yashica Canada Ltd., 7470 Bath Road, Mississauga, Ontario L4T 1L2

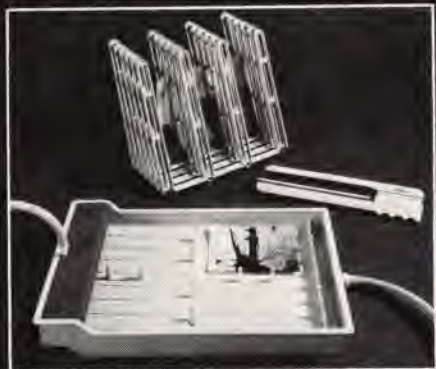
YASHICA

and the Yashica FR is in the last paragraph.



Look what Yashica's doing now.

PRODUCT PROOF SHEET



PATERSON INTRODUCES DARKROOM PRINT SYSTEM FOR RESIN-COATED PAPERS

To facilitate printing with resin-coated papers Paterson offers three new darkroom items molded from high-impact styrene to be lightweight, durable and corrosion free. **Paterson High Speed Print Washer** handles one 12x16 or 11x14, two 8x10 or four 5x7 prints at a time. It is designed to give rapid water flow across both sides of the print for efficient washing. Suggested retail price is \$31.95.

Paterson Print Squeegee removes excess water from prints easily, efficiently and without danger of physical damage due to the floating-action blade. Prints up to 8x10 can be squeegeed in two strokes, larger prints up to 16x20 with four strokes. Grip is designed for comfortable handling. Suggested retail price is \$12.95.

Paterson Rapid Print Drying Rack holds up to five 12x16 or 11x14 prints or 10 8x10s by supporting them on edge with minimum contact and maximum air circulation. Racks are modular to permit several to be joined for drying larger number of prints. Suggested retail price is \$19.95.

Paterson products are marketed in the United States by Braun North America, a division of The Gillette Co., 55 Cambridge Parkway, Cambridge, Massachusetts 02142.



IT'S TIME FOR A KEARSARGE TIMER

The Kearsarge 401 Darkroom Time Computer provides programmed audio alarms and establishes a central control point for precision timing of all darkroom functions. It has program-switched AC outlets for enlarger, color drum and safelight plus positive detent switching, electronic memory, automatic reset and end alarms, 30-second alarms for film development agitations and one-second alarms for burning and dodging. Large, .6-inch digits dim automatically when lights are off to prevent eye fatigue and paper fogging. Timer is dual range, functioning in .1-second intervals up to 99.9 seconds and .1-minute intervals up to 99.9 minutes. List price is \$199.95, and the unit has a one-year parts and labor warranty. Further information may be obtained from Department R-1, Photographic Systems Division, Kearsarge Industries, Inc., 1351 Northgate Square, Reston, Virginia 22090.



YASHICA OFFERS NEW "FR" CAMERA

The Yashica FR is a semiautomatic version of the Contax RTS camera with a compact Yashica Winder. It utilizes many of the system accessories for the Contax plus a complete set of Yashica accessories. The FR has an electronically timed focal-plane shutter with speeds from 1/1000 to one second plus B actuated by an electromagnetic release system. LED display in viewfinder shows maximum aperture of lens in use, aperture and shutter settings. Removable, hinged back permits replacement by Yashica Data Back. Multiple exposures are possible by momentarily depressing film rewind button at start of shutter-cocking operation. The winder has one mode—continuous operation at a film-drive rate of two frames per second at speeds between 1/1000 and 1/60 and as fast as the shutter cycle can be completed at slower speeds. Single exposures can be achieved by pressing and releasing release button. Other features include self-timer, battery check, film speed range of 12-3200, CdS light meter, full aperture viewing, diagonal split-image focusing with microprism collar, X flash sync at 1/60 by hot shoe or PC socket and depth-of-field preview. Yashica FR camera, available in black only, with 50mm f/1.7 Yashica ML bayonet-mount lens carries a suggested retail price of \$412.50 plus \$27.50 for carrying case and \$165 for the winder. Contact Yashica, Inc., 50-17 Queens Blvd., Woodside, New York 11377, for complete details.



NEW LTD GALLEY CONTACT PRINTER OFFERED

LTD's new Galley Printer for contact printing, proofing and copy framing features horizontal opening to give photographer easy access. Oversized cover plate—8 3/4 x 10 3/4 inches—allows more working space. The base, constructed of heavy-duty plastic, is topped by a glass coverplate. With a suggested retail price of \$14.95, the LTD Galley Printer is a product of Fournier Ltd., 7346 Melrose Street, Buena Park, California 90621.



BESELER INTRODUCES 6x7 MULTIFORMAT ENLARGER

Model 67C 6x7 enlarger accommodates all negative sizes 6x7cm and smaller: 2 1/4 x 2 1/4, 35mm, 126 and 110. Its four-inch diameter, optically ground and polished glass double-condenser system uniformly illuminates the entire 6x7 negative area. An auxiliary condenser, supplied with enlarger, is used with 35mm and smaller formats. The unit's aluminum "torsional I-beam" column weighs over eight pounds and combines I-beam and circular cross-section strength and rigidity. Column rotates for floor projection. Three knurled knobs attach column to baseboard, and an accessory wall-mounting bracket is available. Carriage rides on two-inch diameter wheels for smooth travel. One-finger operation elevates the lamphouse and locks it in open position. It contains a filter holder for 3 1/2-inch above-the-negative printing filters and accessory heat-absorbing glass. Hinged, spring-loaded negative carrier has headed guidance and orientation pins for precise lateral negative positioning. Aluminum lens boards are 2 1/2 inches square. One standard board accepts all Leica-mount enlarging lenses; another accommodates Schneider mounts. A spring-loaded quick-release mechanism simplifies and speeds lens board insertion and removal. Negative carriers include one for the Mamiya M645 camera, for 2x2-inch mounted slides and semiautomatic Negatrans carriers for 35mm and 6x6/6x7 film. A full range of accessories is available including variable-contrast filter sets, light integrator and portrait soft-focus grid; red safety filter is included as standard equipment. Suggested list price of the Beseler 67C is \$209.95. Contact Beseler Photo Marketing Co., Inc., 8 Fernwood Road, Florham Park, New Jersey 07932.

(Continued on page 120)

Please mention PhotoGraphic Magazine when inquiring to manufacturers about the items listed in "Product Proof Sheet."

New product information should be sent to the attention of Karen Geller, Managing Editor, PhotoGraphic Magazine, 8490 Sunset Boulevard, Los Angeles, California 90069.

Find a San Juan sunrise in seconds.

Slide Cube™ Cartridges offer an efficient, economical, space-saving way to organize slides of San Juan, San Francisco, or Santa Claus, Indiana.

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convenient storage lids, and more.

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80 Slides vs 640 Slides

BHMC

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TC. SON OF T3.

At Konica, we've been making automatic SLR's longer than anyone else. And now, we've perfected a whole new kind of automatic SLR: an inexpensive one.

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It took us literally five years to make this breakthrough, because we had to engineer the way to cut back on the price without cutting back on the quality. And not to brag, but the "TC" is an incredible *little*

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Weight: 25% less than a conventional SLR, and 25% smaller. After all, it's one of the new compact generation of SLR's.

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A unique meter/shutter switch that turns you and your camera "on" and ready to shoot, or turns the meter "off" and locks the shutter release...all at the touch of a button.

And the vertical-travel, multi-bladed stainless steel Copal shutter that synchs electronic flash up to 1/125 second.

Quite honestly, there's not an advertisement in the world that can do the new "TC" justice. You simply have to hold it in your hands, marvel at its features, its "feel" and its price. So visit your Konica dealer today, or at the very least, write for full details to:

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KONICA TC AUTOREFLEX

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THE NEW KONICA AUTOREFLEX TC.
THE WORLD'S FIRST INEXPENSIVE EXPENSIVE CAMERA.

Actual
Size



The Vivitar Complete Light Machine

a systems approach to portable electronic flash.

The basic Vivitar 283



2



3



4



5



6



7



8

1 The Vivitar 283 is the most sophisticated and versatile shoe mounted portable electronic flash system ever devised. With it the photographer has an unprecedented variety of options in the control of light...direction, intensity, color, and angle of coverage...and can create lighting effects heretofore possible only with bulky and very expensive studio equipment. The standard power source is a special battery holder for 4 AA alkaline batteries. Recycle time is 0.5 to 9.0 seconds with 75 to 800 flashes per battery set. Extra holders are available so you can carry fresh back-up batteries ready to reload in an instant. The 283 comes with PC cord and 1.2 meter remote sensor cord. Once you have the basic 283, you can build your own custom flash system by choosing from the optional accessories according to your specific photographic objectives.

2 Charge 15 Vivitar NC-3 NiCad Battery Packs for the 283 recharge in only 15 minutes in Vivitar's new Charge 15 fully automatic external charger. There's also an optional SB-4 AC Adapter so you can power the 283 with 110V-125V AC house current.

3 High Voltage Battery Pack The HVP-1 High Voltage Battery Pack Regulator converts a 510 volt photo battery to the 330 volts the 283 requires and maintains that voltage to ± 20 volts, within $\pm 1/4$ f-stop. Recycle time is 0.5 to 3 seconds with up to 750 full power flashes available.

4 Soft Light/Bounce Reflector The lightweight holder snaps onto the 283 and holds a standardized 90% white reflectance card for perfectly controlled bounce/soft light portraits and still lifes.

5 Flash Lens/Filter Adapter This precisely engineered attachment snaps on over the flash head to position Vivitar Flash Filters and Vivitar Variable Angle Flash Lenses at an exact distance from the head.

6 Filtered Flash A special six-filter kit (for use with the adapter) includes a 4X neutral density filter for extreme close up flash exposures in automatic operation. A UV filter to eliminate Ektachrome "blues." A Type B conversion filter to give proper color balance when using Type B film with electronic flash. And red, blue, and yellow filters for special effects.

7 Variable Angle Lens Kit Two lenses for wide angle, two for telephoto. The extra wide angle is for use with 24mm camera lenses. The regular wide angle is for

28mm camera lenses. The short tele lens is for shooting in the 70mm and up range. The long tele lens is for 135mm and longer lenses.

8 Quick Release Flash Brackets This bracket gives you a solid, controlled platform for flash shooting. The quick release lets you remove the pistol grip/flash unit for off camera flash and aim it anywhere you want for bounce or direct lighting. The flash shoe rotates 360 degrees for complete control of direction and angle. Choice of 35mm or 6 x 6 camera bracket.

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Photographic's

SPEC SHEET

FUJICA ST605



TYPE: 35mm single-lens reflex

LENS MOUNT: Praktica screw mount

SIZE: 5 1/4" long x 3 3/4" high x 1 3/4" deep (133mm x 86mm x 46mm) (body only)

WEIGHT: 20 ozs. (567g) (body only)

BASIC PACKAGE: Camera body, normal lens, lens cap, neck strap, rubber eyecup, batteries and semihard case

PRICES: \$240 with 55mm f/2.2 normal lens

DISTRIBUTOR: Fuji Photo Film U.S.A., Inc., 350 Fifth Ave., New York, New York 10001

FEATURES

Viewfinder: Fixed eye-level pentaprism with non-removable focusing screen. Viewfinder screen has central split image with microprism collar surrounded by ground glass. 92 percent of picture area is seen in viewfinder. Meter needle and zero mark with over/underexposure indicator visible in viewfinder.

Shutter: Focal-plane type with mechanically controlled speeds from 1/2 to 1/700 second plus bulb.

Mirror: Automatic, instant-return type.

Automation: None

Exposure Meter: Averaging, through-the-lens, stop-down type. Meter activated by depressing depth-of-field preview button. Two silicon blue light-sensitive cells are used. ASA range 25 to 3200.

Frame Counter: Automatic, additive type; exposed frame numbers visible in window adjacent to film advance.

Film Advance: Single-stroke, ratcheted for several short strokes; standoff facilitated by hinged tip.

Flash Synchronization: Synchronized for electronic flash at 1/60 second. Both hot-shoe contact and PC connector are provided.

Accessory Shoe: Hot-shoe-type accessory mount located on top of pentaprism.

Self-Timer: An 8- to 10-second delay can be set with lever on front of body.

Battery: Two 1.5-volt silver oxide batteries are required. Battery receptacle on camera back next to viewfinder; Eveready S-76E or Mallory MS-76H are recommended.

Battery Check: None

Lenses Available: A complete line of EBC Fujinon lenses are available in focal lengths from 16mm to 1000mm, including a fisheye, macro lens, soft-focus lens and two zooms. Also, lenses of every type, focal length, cost and quality have been made with the Praktica screw mount. Most of these lenses should be usable on the Fujica ST605.

Accessories: Optional extras include soft and hard cases, eyesight adjustment lens, right-angle finder, close-up lenses, auto extension tubes, microscope adapter, reverse adapter, bellows and lens hood.

COMMENTS

Fuji has introduced a budget-priced camera that combines quality construction and basic features to make it an excellent choice for anyone making the move from occasional snapshotter to serious photographer. The ST605 should also appeal to anyone already committed to Praktica screw-mount lenses who would like to take advantage of the superb accuracy and ease of metering with silicon blue cells. Most of the features of the ST605 are tried and true functions, infinitely refined to make it a smoothly operating, quick handling camera. The addition of an up-to-the-minute, accurate, fast reacting metering system should insure the fewest mistakes in picture taking.

In addition to the excellent finish usually associated with more expensive equipment, Fuji has included some human engineering features that make the camera easy to live with. The location of the stop-down meter switch button near the lens and below the shutter release allows operation of both functions without shifting hand position. The hinged tip of the film advance lever makes winding film without removing camera from viewing position as easy as possible. A large rewind knob that includes the back release is part of a well worked-out load and unload system that is as fast and foolproof as you can get. Beveled body edges and well-separated, distinct focusing and aperture rings add to an instrument that is extremely comfortable to handle. From the standpoint of use and performance the ST605 is an exceptional value.

Photographic's SPEC SHEET

FUJICA ST705



TYPE: 35mm single-lens reflex

LENS MOUNT: Praktica screw mount

SIZE: 5 1/4" long x 3 3/4" high x 1 3/4" deep
(133mm x 86mm x 46mm) (body only)

WEIGHT: 20 ozs. (567g) (body only)

BASIC PACKAGE: Camera body, normal lens, lens cap, neck strap, rubber eyecup, batteries and semihard case

PRICES: \$320 with 55mm f/1.8 normal lens

DISTRIBUTOR: Fuji Photo Film U.S.A., Inc., 350 Fifth Ave., New York, New York 10001

FEATURES

Viewfinder: Fixed eye-level pentaprism with non-removable focusing screen. Viewfinder screen has central split image with microprism collar surrounded by ground glass. 92 percent of picture area is seen in viewfinder. Meter needle and zero mark with over/underexposure indicator visible in viewfinder.

Shutter: Focal-plane type with mechanically controlled speeds from one to 1/1500 second plus bulb.

Mirror: Automatic, instant-return type.

Automation: None

Exposure Meter: Averaging, through-the-lens, full-aperture type. Meter activated by partially depressing shutter release. Two silicon blue light-sensitive cells are used. ASA range 25 to 3200.

Frame Counter: Automatic, additive type; exposed frame numbers visible in window adjacent to film advance.

Film Advance: Single-stroke, ratcheted for several short strokes; standoff facilitated by hinged tip.

Flash Synchronization: Synchronized for both focal-plane bulbs and electronic flash. X sync at 1/60 second. Separate PC terminals for X and FP sync on camera body.

Accessory Shoe: Hot-shoe-type accessory mount with X sync located on top of pentaprism.

Self-Timer: An 8- to 10-second delay can be set with lever on front of body.

Battery: Two 1.5-volt silver oxide batteries are required. Battery receptacle on camera back next to viewfinder; Eveready S-76E or Mallory MS-764 are recommended.

Battery Check: None

Lenses Available: A complete line of EBC Fujinon lenses are available in focal lengths from 16mm to 1000mm, including a fisheye, a macro lens, a soft-focus lens and two zooms. Also, lenses of every type, focal length, cost and quality have been made with the Praktica screw mount. Most of these lenses should be usable on the Fujica ST705.

Accessories: Optional extras include soft and hard cases, eyesight adjustment lens, right-angle finder, close-up lenses, auto-extension tubes, microscope adapter, Leica mount adapter, reverse adapter, bellows and lens hood.

COMMENTS

At a few dollars more than the ST605, the Fujica ST705 is still in the price range for the budget minded with all the good basic design qualities of the ST605 and several additional features that extend its usefulness considerably. Shutter speeds are extended to include a full second and a very useful 1/1500 second. The normal 55mm f/1.8 lens provides more complete correction for critical results and easier, more accurate focusing. Flash synchronization is extended to include focal-plane bulbs. It's likely that the most popular feature will be the full-aperture meter reading, with very sensible placement of the meter actuating switch in the shutter release.

If asked to recommend a camera for a serious enthusiast or photography student within the price of the Fujica, one would be hard pressed to match the quality and features of the ST705. If a camera is chosen for what it can do and how well, there is little more to look for than what the ST705 is capable of. With the inclusion of the best type of in-camera metering available, the Fujica embodies all of the refined and proven functions as well as the most practical, recent innovations of contemporary camera design.

You have the talent... We can give you the secrets!



How many times have you tried to fix a car or make a speech, and ended up feeling foolish and frustrated?

Well, it's similar with photography. You have the interest and the talent, but something is holding you back. It's knowledge. It's really tough for an amateur to obtain the knowledge and confidence on his own to be a photographer.

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You'll find that your SMP instructors will take the time to help you individually to be sure that you understand. They are concerned for your success.

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A SHOT IN THE DARK GETS A SHOT IN THE ARM

Can a hypodermic syringe with eight cubic centimeters of clear, odorless liquid really inject a new dimension into existing light photography? Paul Farber's remarks in August, 1976 "Guide Lines" made me very curious. I share his usual skepticism about pushing development to increase film speed, but does this new developer additive, Factor 8 by Min/Max, truly produce increased film speed without sacrificing image quality? Such a possibility deserves thorough exploration. If Mr. Farber's observations would apply over a wide spectrum of situations, it could be a major breakthrough in film printing and processing. The possibility that Factor 8 wouldn't require changing from my usual brands of developers had me on the edge of my chair! I couldn't wait to

expose some film and get into the darkroom.

It wouldn't be difficult to confirm the claim to increased film speed. For those not familiar with the test procedure, only an Eastman Kodak Gray Scale and a reliable densitometer are required. The procedure is to expose a pair of rolls of a particular brand of film using the gray scale as a target, bracketing exposures at $\frac{1}{3}$ -stop intervals for one stop under the reading for the rated ASA index and for two stops over that mark. Then one roll is developed according to the manufacturer's recommendations and the second using Factor 8 per Min/Max instructions. By comparing the density readings of each roll of film, the relative exposure index for each can be determined, and any increase in true film speed will be

revealed.

Whether or not Factor 8 will allow an increase in film speed is only a small part of the answer to the question of the product's usefulness. The rest involves whether negatives resulting from the use of Factor 8 will produce *quality* prints. That evaluation would require a thorough lab examination of at least two film/developer combinations and an extensive practical test of a variety of subjects and lighting conditions.

WHAT PUSHING SHOULD DO

As Farber indicated, the obvious use of Factor 8 is in available light photography. But then the question arises: What is available light photography? This most important ingredient in the practice of photography—light—in all its existing forms has infinite variety, beyond definition and classification.

WHAT'S NEW IN AVAILABLE LIGHT? BY DAVID BROOKS

The only recourse to making a field test would be an arbitrary choice of limited subjects and situations. So I planned my field test to involve only particular areas of individual interest.

In the recent past I have been a frequent user of a popular "speed" developer. My experiences with this product have taught me to expect to pay a high price for a higher exposure index with increased graininess, poor tone gradation and separation and an invariable loss of shadow detail. So my skepticism was based on experience—I received poorer quality prints for increased film speed. If the use of Factor 8 to increase film speed does not exact a high price in lost image quality, as Min/Max claims, the application of push processing could be extended into many areas where the higher film

speed would be extremely valuable, but the effects of "blitz" developers had always prohibited this for me and many others.

QUALITIES TO LOOK FOR IN A NEGATIVE

Some of my photographic interests that involve using existing light and therefore necessitate increased film speeds include glamour portraiture, pictorials and scenics and photographing moving subjects under low light levels. Maintaining good tone separation and gradation are paramount concerns when photographing a lovely model in soft window light or open shade. The preservation of fine detail in brightly illuminated textures and in the subtle light of deep shade are first-order concerns for making fine prints of pictorial or scenic subjects. Good

1. Dune buggy going home from the dunes of Pismo Beach, California, at sunset was taken with Mamiya M645 with Mamiya/Sekor 150mm f/4 lens on Kodak Tri-X Film rated at E.I. 500, developed in Kodak HC-110, Dilution B with Factor 8 for 7½ minutes at 68°F. Exposure was 1/60 at f/5.6.

2. Close-up of tidepool in bright sun taken handheld using Mamiya M645 with Mamiya/Sekor 45mm f/2.8 lens on Tri-X film rated at E.I. 500, developed in HC-110, Dilution B with Factor 8 for 7½ minutes at 68°F. Exposure was 1/250 at f/16.

definition is required to emphasize the impact of an action shot that may have been taken under very low light levels and extremes of contrast.

We are concerned with negative qualities that are not solely influenced by the effects of a developer. Available light photography requires a great deal of attention to making an exposure which captures the potential quality in

A SHOT IN THE DARK

the latent image. Sharpness is as much a function of careful focusing and steady camera handling as it is of the film/developer acutance potential. Whether depth of field will adequately define the distance range of a scene depends upon both the exact placement of the plane of critical focus and the film speed permitting a sufficiently small aperture. Of all the elements that affect quality, exposure has the most influence.

Even though the principle of good negative exposure (exposing just enough to record shadow detail and no more) is simple enough, its practical application is fraught with complexities. Meter performance, regardless of type or brand, is influenced by the scene brightness range, angle of incidence, atmospheric conditions and how they are read. To expose film with critical accuracy all of the variables must be balanced against a personal interpretation of the scene and the photographic image desired—functions of judgment based on experience. Underexposure will cause loss of shadow detail, cut contrast and brilliance and distort tonal relationships. Overexposure will make graininess apparent, block highlight detail and impair acutance.

The choice of too slow a shutter speed to halt a moving subject will prevent capturing subject definition that no amount of film/developer quality can restore. How a film is developed is of little concern if the exposure was made handheld when the situation demanded use of a tripod.

Ideally, a test should involve as few variables as possible. But as it is the very nature of available light to be variable, a degree of objectivity can only be reached by introducing as few human variables as possible. Before the test can proceed further, I should clarify some terms, which in Min/Max's instructions seem vague.

It is suggested that to increase film speed by one stop, developing time should be increased 50 percent after adding eight milliliters of Factor 8 to one liter of working developer solution. Does this mean you can double the rated ASA index, or does it mean you can obtain a one f-stop increase over a corrected exposure index for a particular film/developer combination?

FACTOR 8 LAB TEST

The answers to questions lay in conducting the laboratory test previously mentioned, using a gray scale and a



1. Jet aircraft landing at night in fog at Los Angeles International Airport was taken with Canon F-1 with Canon 55mm 1/1.2 aspheric lens on Ilford HP4 Film rated at E.I. 1200, developed in Microphen with Factor 8 for 14 minutes at 68°F. Exposure was 1/60 at f/2.

2. Sun streaking through early morning fog in a eucalyptus grove near Nipomo, California, was photographed with Bronica ETR and Zenanon 40mm 1/4 lens. Exposure made on Ilford Pan F Film rated at ASA 32, developed in Ilford Microphen diluted 1:1 for four minutes at 68°F. Exposure was two seconds at f/11.

densitometer. For the purpose of this test the two most popular fast films and their respective recommended developers were chosen: Kodak Tri-X in 120 size to be developed in Kodak HC-110, Dilution B and Ilford HP4 35mm film to be developed in Ilford Microphen. Several rolls of each film were exposed to the gray scale in identical fashion, so each frame would reflect a different film speed ranging from ½ the ASA rating to twice the ASA rating. Lighting and exposure settings were carefully controlled by using an 18-percent reflectance gray card and two 1° spot meters made by different manufacturers.

One roll of Tri-X was developed according to Kodak's recommendations in HC-110, Dilution B (five minutes at 68°F.). One roll of HP4 was developed in Microphen diluted 1:1 according to Ilford's recommendations (nine minutes at 68°F.). The resulting negatives were then read on a Cosar Model 50 electronic digital densitometer to determine the base density plus fog. To establish film speed using a densitometer, a popular rule of thumb is that a properly exposed negative is one where the deepest shadow area in which detail is to register on the print should read 0.1 over the base density reading.

For instance, if the base density reading is 0.23, then the shadows

should read at least 0.33. On the gray scales, the darkest segment, 1.90, is used to correspond to the shadow area. Each roll of film was read to find the value of the 1.90 segment for each film speed. The film speed that came closest to having the 1.90 segment reading 0.10 over the base reading was identified. By this method a corrected exposure index (E.I.) of 250 for Tri-X and 320 for HP4 was established.

Then all segments of reflectance value on the gray scale were read from the negative taken at the corrected E.I. These densities were plotted against the reflectance values of the gray scale on graph paper to draw a characteristic curve of the contrast performance of each film. Also, the gray scale negative for each film at the corrected E.I. was printed on grade No. 2 enlarging paper to determine contrast in practical terms.

The next step was to develop identically exposed rolls of film in their respective developers adding Factor 8. One roll each was developed for a one-stop push using eight milliliters of Factor 8 in a liter of working solution, increasing the developing time by 50 percent: Tri-X, HC-110, Dilution B for 7½ minutes at 68°F. and HP4, Microphen 1:1 dilution for 13½ minutes at 68°F. One roll each was developed for a two-stop push using eight milliliters of Factor 8 to a liter of working solution, increasing the developing time by 100 percent: Tri-X, HC-110, Dilution B for 10 minutes at 68°F.; HP4, Microphen straight (to reduce total developing time from 18 minutes) for 14 minutes at 68°F.

LAB TEST RESULT

The gray scales of the respective negative frames of each film at two times and four times the corrected exposure index were read with the densitometer, and curves were plotted on the graph paper for each sample. Reading the results and comparing the characteristic curves led to the following evaluation of film speed and contrast. At a one-stop push, Factor 8 produces a negative for each film/developer combination that very closely parallels the characteristics of a normally rated and developed sample. There is a slight loss of overall density, but it is so slight, it has an insignificant functional value. At a two-stop push, the curves continue to remain parallel to a very large degree with only a slight increase in contrast. However, again there is an additional loss of overall density that may begin to effect the loss of some shadow detail.

Do these test results support the claims of Min/Max for Factor 8? In all essential respects a true increase of film speed without significant increase in contrast can be obtained. The only qualification to the claim is that it is based on a true, corrected film speed established with the camera or cameras and metering that will be in use.

At this point, only one factor influencing final print quality has been established in favor of Factor 8. The characteristics of grain, tone separation and gradation and acutance, as they are reflected in a printed image, must await the results of a field test for final evaluation.

TEST FOR NEGATIVE QUALITY

The first field test consisted of two virtually identical sessions photographing models in existing window light with Tri-X 120 film. One session involved exposing the film at the corrected E.I. of 250 for normal development in HC-110, Dilution B. For the second session exposures were at an E.I. of 500 using Factor 8 and a 50-percent increase in development time. A selection of negatives from each session was printed on 11x14 Kodak Ektamatic SC double-weight glossy paper.

Comparing the prints from the two sessions was very difficult. There were virtually no discernible differences for any aspect of quality. Apparent graininess in both instances was at a minimum, especially considering the conditions of soft light, delicate subject tones and soft-focus effects—all of which readily show any tendency toward negative graininess. Tone separation and gradation for both samples were very acceptable, particularly in the important highlight and midtone areas. Shadow detail was adequate with no distinction from one sample to another in acutance across the entire tonal range.

The second test was more complex, and the base for comparison was patently unfair to Min/Max. An extensive three-day shooting trip along the Central California coast was recorded on over 40 rolls of Ilford Pan F and Kodak Panatomic-X, exposed and developed normally, and Tri-X rated at E.I. 500 and one-stop push developed using Factor 8. Every extreme that could cause difficulty was purposely sought out. Backlit scenes, shooting directly into the sun, flat scenes illuminated by overcast sky, atmospheric conditions of mist and fog and the deep shade of a forest were all exposed for my test purposes.

I was really skeptical about how

2



A SHOT IN THE DARK

Tri-X would perform with scenic subjects that put such heavy demands on a film's ability to record fine detail, broad ranges of brightness and subtle tone distinctions all in the same composition. Much to my surprise, the resultant negatives were almost entirely printable. Very few shots were lost, and most of those were due to my foolhardy attempts to accomplish the impossible.

RESULTS AT +ONE STOP

An evaluation of the prints from a selection of the pictorial and scenic negatives revealed much less difference between the results of using a slow, fine grain film and Tri-X at E.I. 500 than would be expected. I would have to make an enlargement considerably larger than the 11x14s printed for the comparison to become obvious. Grain was not apparent, except in areas of clear sky or similar large, flat planes. Acutance was acceptable. Shadow detail was very good, and there was surprising lack of highlight blocking.

With so much positive experience behind me I went into the third and most likely area of application of push processing—low light levels. It was the Fourth of July, so I had to expose at least one roll of fireworks. An E.I. of 1200 for HP4 allowed me to use my Canon F-1 with a Canon 300mm f/2.8 Fluorite lens, handheld at 1/60 second wide open. The bursting rockets filled the frame from a mile away, and incredibly sharp, crisply defined negatives were the result.

The bulk of the third test combined low light levels and moving subjects. Another unexpected element entered the situation—fog at Los Angeles International Airport—making the shooting of jets landing at night an eerie experience. At least the fog gave me an idea of what exposure level to use. Rather than just making a guess and bracketing exposures, I used a spot meter to read the light caught in the fog from the runway lights. But I should have just guessed, as I was one to two-stops underexposed.



ALL PHOTOS BY THE AUTHOR.



1. Glamour portrait taken indoors with diffuse window light illuminating the subject. Model photographed with Mamiya M645 and handmade soft-focus lens (see January, 1973 issue) on Tri-X film, E.I. 250, developed in HC-110, Dilution B for five minutes at 68°F. Exposure was 1/30 at f/6.3.

2. Glamour portrait taken indoors with diffuse window light illuminating subject. Model photographed with Mamiya M645 and handmade soft-focus lens on Tri-X film, E.I. 500, developed in HC-110, Dilution B with Min/Max Factor 8 for 7½ minutes at 68°F. Exposure was 1/60 at f/6.3.

FP4 vs. the 400 ASA film you're using.

Are you giving up more than you're getting when you use 400 ASA as your standard?



Like many photographers, you probably use a 400 ASA film as your standard film. And that's great if *most all* your shots are low light or fast action shots.

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You can use any standard developer to process FP4 but, to get

even more flexibility, you can develop for extra fine grain at lower ASA's with our Perceptol developer, or for extra speed with our Microphen developer. **How we build this exceptional latitude into FP4.**

FP4 has two emulsion coatings. By combining two emulsion types in a single film, FP4 gives you an extended tonal range that is simply not achievable with a single emulsion coating. The result is a film with beautifully clear highlights and the finest shadow detail you can imagine. **Shoot this simple "latitude" test and prove FP4 to yourself.**

Load your camera with FP4 and set the ASA indicator at 125. Then select a sunlit scene with deep shadows and set the shutter at 1/250 of a second. Without changing the F-stop indicated by your meter, shoot a series of exposures from 1/1000 down to $\frac{1}{2}$ second (2 stops under 7 stops over). Develop the film with your favorite D76-type formula in the normal fashion (about 6 $\frac{1}{2}$ minutes). Print the "normal" negative first. Then print the "2 under" test negative and the "7 over" test negative (no matter how dense it appears), compensating for exposure differences in the negatives by adjusting the exposure time only.

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A SHOT IN THE DARK

RESULTS AT +TWO STOPS

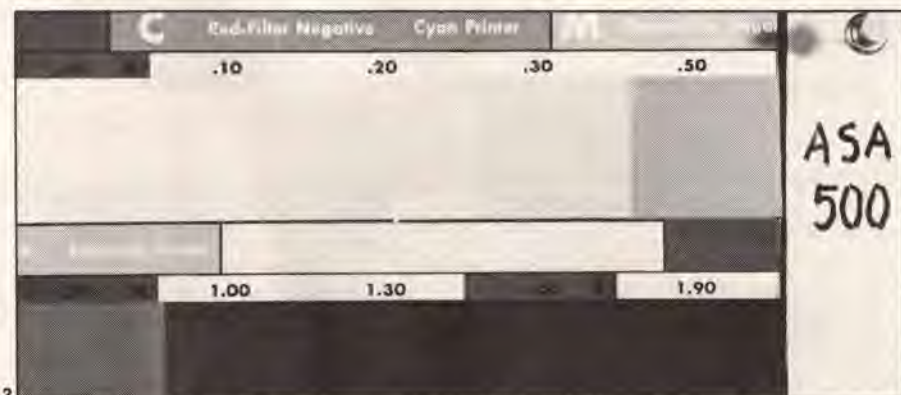
But this was all for the best because it established the fact that there is still some latitude even when HP4 is rated at E.I. 1200 with a 100-percent increase in development with Factor 8. The negatives were not too difficult to print using Nos. 3 and 3½ Polycontrast filters with Kodak Ektamatic SC enlarging paper.

The prints of the landing jets, though far from salon quality, had good definition, reasonable acutance and enough shadow detail to separate tones. I was not surprised, however, to get some graininess (if anything will make grain apparent in a print, foggy conditions will do it), but the amount of grain in these prints was considerable. Considering that there is less graininess with HP4 rated at E.I. 650 and push processed with Factor 8 for 50-percent developing time than there is with E.I. 320 and normal development, the dramatic increase in grain at 1200 defies reason.

The results of the tests made several aspects of existing light photography techniques apparent as well as confirm Min/Max claims for the performance potential of Factor 8. First of

all, an increased film speed has many advantages in some kinds of photographic applications that might seem unlikely. For instance, using a higher shutter speed in glamour photography can freeze a fleeting expression or allow you to remove the camera from the tripod to shoot from an unusual angle. To be able to grab a shot quickly as the sun sinks may only be possible with an extended exposure index. To achieve sufficient depth of field along with a fast enough shutter speed to stop movement in a shaded forest area may be practical only with a film-speed push.

The price you pay in lowered print quality by pushing the two fast films tested using Factor 8 is surprisingly small. But if you don't need the film speed to stop action, gain depth of field or capture images in low light levels, superior quality is always a dividend when the slowest film possible is used, even in available light photography. If you have to have the speed, there is nothing better to recommend than Factor 8 by Min/Max. You may ask for the product at your local photo dealer or write Min/Max, P.O. Box M, Harbor City, California 90710, or Box 4990, Main Post Office, Vancouver, B.C., Canada.



1. HP4 film developed in Microphen straight with eight milliliters of Factor 8 in one liter of developer solution for 14 minutes at 68°F., printed on Kodak Ektamatic SC paper with a No. 2 Polycontrast filter and developed in Kodak Dektol.

2. Tri-X film developed in HC-110, Dilution B with eight milliliters of Factor 8 in one liter of working solution for 7½ minutes at 68°F., printed on Ektamatic SC paper with a No. 2 Polycontrast filter and developed in Dektol.



The New Beseler 67C...

A Close Look At Some Details That Help Make It The Best Enlarger of Its Kind

Each function of the new Beseler 67C is designed to help you turn great photography into superb prints. Take, for example, our lamphouse. It delivers **more light**, and **more uniform light**, than any comparably-priced enlarger. You'll find it's well thought out in every way:

- Precision-ground optical glass condenser design provides superior illumination of black-and-white or color negatives from 110 Pocket Instamatic up to 6 x 7 cm (2-1/4" x 2-3/4"). Two 4" condensers mounted on steel plates are used for 6 x 4.5, 6 x 6, or 6 x 7 negs—a 3" auxiliary condenser (also mounted on a steel plate) is supplied to optimize illumination for negatives 35mm and smaller.
- The exclusive 75-watt PH111A lamp used in the 67C projects 30% more light on the baseboard than the 75-watt lamps used in other enlargers.
- Filter holder slides out to accept 3-1/2" color printing filters. Provision for mounted Heat Absorbing Glass also included.
- Die-cast construction of lamphouse offers greater durability and solidity.
- Grooved ribs on side of lamphouse help to dissipate heat by radiation and cool lamphouse more effectively.
- A porcelain lamp socket is one of the many design features that have earned the 67C a U.L. approval.
- Lamp door slides up for easy access and is designed so it stays open when lifted, freeing both hands to insert or remove filters, condensers, or change lamps.
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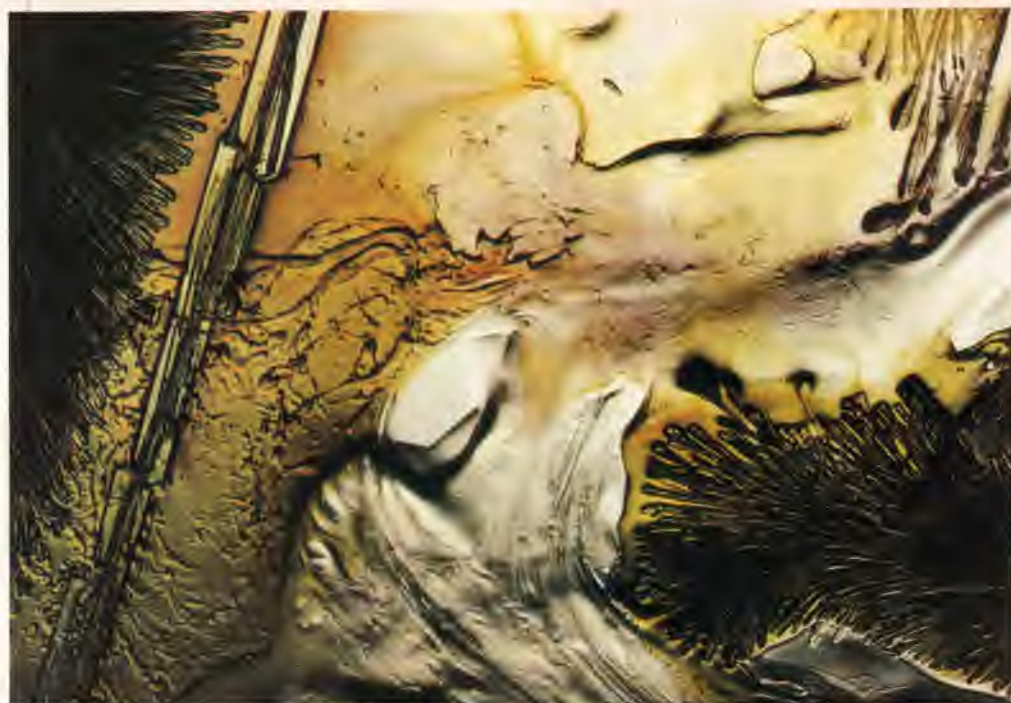
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It is an exciting challenge to conceive ideas and processes that allow the photographer to create from his/her own designed images. It is with the intention of arriving at flexibility and control of the medium that I like to bring about original compositions of form and color. These images become, for the viewer, a vision of the imagination.

One such approach is an expanded version of filmless color printing. The

1. This print was made with crystal dyes applied to a thin coat of polymer covering only portions of plate, so crystallization only occurred in parts of image. Print was made with an exposure of four minutes, 15 seconds in a condenser enlarger set at f/11 in the 2 1/4 position.

2. Ektachrome print was made with crystal and lamp color dyes painted on polymer. Color was intensified by repainting the plate twice after drying. Exposure was for five minutes at f/11 with the condenser enlarger at the 2 1/4 position.

3. Thin coatings of crystal dyes and lamp colorings were intermixed to create this abstract image. Print was exposed for 24 seconds at f/11 in a condenser enlarger in the 35mm position.

PHOTOS FROM A PALETTE

colorful
abstractions
the easy way

by charles braendle





PHOTOS FROM A PALETTE

procedure involves creating a contoured painted surface on glass that can be inserted into the negative carrier of an enlarger and projection printed. Light is passed through and obliquely across the surface and printed positive to positive on Kodak Ektachrome RC color paper.

You'll need just a few basic materials to begin, then you can add other supplies as you go along. A box of slide cover glass (2x2 inches) from your photo dealer will give you an ample supply of ideal surfaces to create and enlarge on. Next, you will need small quantities of transparent dyes or paints, a bottle of liquid polymer medium and various sized brushes. Crystallizing paints, lamp coloring and glass staining compounds are well suited for light transmission, and each material is capable of unique effects and reactions. Most hobby shops carry at least one of these types of paints in various colors. If you cannot find these locally, the Edmund Scientific Company, 150 Edscorp Building, Barrington, New Jersey 08007, carries both crystal paints and lamp colorings. Liquid polymer is available at hobby shops and art supply stores.

It is easy to start with too many variables and then come up with an uncontrollable process. To prevent this, begin by painting with just one type of paint per glass plate and watch how it dries. I usually apply the paints by brush, but when you want very fine lines or drop effects, you can use other materials, such as toothpicks and pins. For example, by varying the thickness of crystalline paint applications, you'll get different crystal structures and arrangements. A very thick coat doesn't always crystallize completely. The thickness of the applied dyes or paints can also be used as a control for color intensity. As you become familiar with the materials, work with different color patterns and designs, using the same type of paint or dye, and notice the mixing effect of the dyes bleeding into one another. The forms of the crystal



1



2

ALL PHOTOS BY THE AUTHOR



3

1. Materials used to prepare painted glass originals include from left to right: Crystal Craze crystallizing paint, Colorine transparent lamp coloring paint, Kodak 2x2-inch slide cover glass, Liquitex gloss polymer medium, Vaseline petroleum jelly and brushes of several sizes.
2. Colored dye is applied to wet polymer on the slide cover glass.
3. Wet glass plates are placed on cardboard strips and covered by plastic drinking cups to dry properly. Plates are numbered in foreground to record painting methods, mixtures and results.



New from Kodak. A unique on-camera microphone for easier sound movies.

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There's also a sound-monitor earphone that lets you hear what the camera is hearing—before and during filming. And a red ON light at the front of the camera that tells people when the camera is running.

The Ektasound 230 camera is equipped with an $f/1.2$ Ektar lens. No focusing needed. The Ektasound 240 camera has a 9–21 mm $f/1.2$ zoom lens and automatic parallax correction.

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PHOTOS FROM A PALETTE

structures make interesting varieties of effects. Once you know the characteristics of the various dyes and paints, combining two or more different materials becomes a creative process.

Since enlargements will be made directly from the glass surfaces, it is important that they be kept clean and dust free. All my surfaces are dried under a supported plate of glass or under inverted plastic cups. Place small strips of cardboard directly beneath the painted glasses like railroad tracks to prevent any paint runoff from drying on the bottom.

The dried plates can now be printed as you would any color transparency. If the 2x2 plate does not fit your negative carrier, it can be placed on top of a 35mm carrier, or you can fit your 2 1/4 x 2 1/4 carrier with a mask from a cardboard cut out slightly smaller than the plate and with an outside perimeter large enough to be taped to either the top or bottom of the carrier. The glass slide can then be positioned on this structure. (Fascinating slide shows can be presented with these materials. To do this, you need only to place another slide cover glass over the painted one, insert both into a metal slide binder and project with your slide projector.)

By using liquid polymer as a foundation base medium, a variation of the projection-printing method, an added dimensional quality can be obtained. Apply the polymer before painting on the dyes, since it is the surface you will mix, contour and paint on. A little experimentation will help to develop planned designs instead of chaos. But there will always be a few surprises, since none of these techniques is completely predictable. Painting the polymer creates a three-dimensional surface. The polymer acts as an absorbent for most colorings and can be a control agent to prevent crystallization in selected areas. If the polymer is vigorously stirred or shaken before application, you can also introduce suspended bubbles and spheres into your compositions.

After coating the glass with polymer, while the surface is still wet, paint on the polymer. The medium will take on the color of the dye and the impression of the brush stroke. The latter effect is more pronounced if the polymer is given a minute or two to set. By swirling a pin or toothpick through the dyes painted in the polymer, you can

create interesting color mixings and line designs. It is always possible to paint over the dried plate to color areas that dried clear to increase saturation or to create a harder edge of color than the soft effect of the absorbed edge.

The impressed surface presents dynamic possibilities when placed in a condenser enlarger. By lowering the condenser elements, you allow more oblique light to crosslight the surface, in addition to the light still passing through the medium-coated plate. On an enlarger such as the Beseler 23 CII you can watch the shadow and detail change when the condenser head is raised and lowered from the 35mm position through the larger format positions. With oblique lighting, the texture of the surface, the brush stroke and the bubble become shadow-edged forms with noticeable variations in color saturation and contrast. These possibilities for creative experimentation can bring about fresh ideas in seeing color that go beyond the darkroom. The end result will be a combination of painted design and sculptured forms that can be further modified by control of light direction.

In order to maintain the three-dimensional quality being projected, it is necessary to stop the enlarging lens down for depth-of-field coverage for the thickness of the surface. The process of stopping down also extends and expands the shadows. By experimenting with different combinations of condenser positions and f-stops, you'll be able to obtain a detailed image. Make the print with whatever positive materials you prefer. The size of the prints and degree of magnification from any one area are virtually unlimited. Printing restrictions are more dependent upon equipment and materials available than on image deterioration.

The quality of color saturation and image sharpness combine with the abstract nature of the painted color designs to make beautifully different color prints. You can obtain a wide range of fascinating results by trying different dyes and surface materials. I've worked with Vaseline, baby oil and food colors, all with good results. Certain combinations of materials will have to remain wet on the plate during printing. Thus, in many instances, new techniques are necessary to bring forth interesting images. These techniques become the individual mode of expression for each photographer who tries the process. □





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The Apartment Darkroom

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Spotlight on...

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TRICOLOR POINTILLISM

Photoimpressionism Comes Into Its Own

BY FRANK BEZ

Trying to find interesting ways to present strong, graphic images occupies much of my time, both in the studio and in the darkroom. The object is to indulge my curiosity and need for experimentation with an eye toward eventually finding a commercial use for the results of my experiments.

The usual types of graphic images are well known. In the photographic process, as examples, we have black-and-white litho effects and color posterization effects. Both, when used intelligently, result in graphic images of strength and visual excitement.

However, I wanted to find a way of presenting something between the pure, beautiful tone range of a conventional print and the graphic saturation of a posterized print. I felt that between convention and posterization, the addition of another element would lead to the exact thing I was trying to achieve.

A chance visit to an art gallery inspired me to investigate Pointillism, an art form in which Neo-Impressionists believed that the juxtaposition of pure colors such as blue and yellow would be viewed as green because the eye would optically mix the blue and yellow dots of pigment.

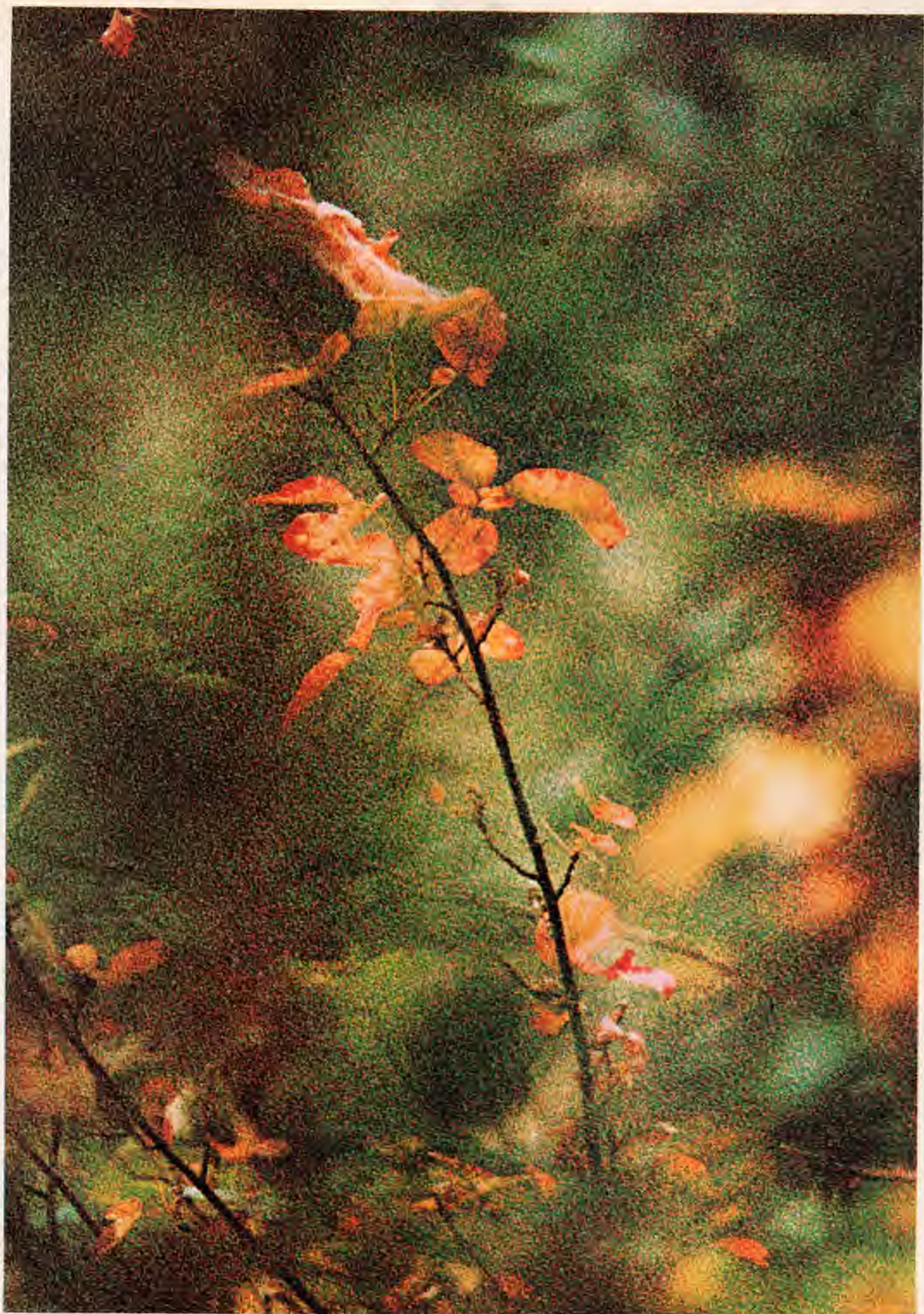
With Pointillism as the basis for my experiments, I set about to find a way to break up the photographic image into dots of saturated primary colors

which, when viewed, would be perceived as a total color print, yet would have the saturation of a posterized print, plus the suggestion of the tone range of a conventional print with the added element that I was searching for—the texture of Pointillism.

Seemingly endless experimentation in the darkroom eventually led to me a successful system for achieving the effect I desired. For those readers of PhotoGraphic who may share my enthusiasm for graphic images and would like to expand your technical abilities, the following information will allow you to duplicate the effects used to illustrate this article.

THE GRAIN SCREEN

In order to break up the photographic image a strong grain texture screen will be needed. Additionally, it will have to be somewhat larger than the largest print you contemplate making. My grain texture screen measures 12x12 inches and will satisfactorily cover an 8x10 print. The usual commercial screens, I discovered, were not strong enough for my purposes. So I made my own. The technique is not difficult. Loading a 2¼x2¼ camera with a roll of Kodak Tri-X Film, I made an exposure of the side of an automobile that had been painted a metallic gray. A clear, blue sky would probably serve as well. This negative was then processed in Acufine.







"Photographic
pointillism
represents
a graphic
process
with many
commercial
applications."



TRICOLOR POINTILLISM

After the negative was processed and dried, I placed it in my enlarger and projected a section of it onto a large sheet of litho film. The litho film was developed in paper developer and when dry represented a positive screen. I'd suggest you try making several screens, using a variety of exposures and enlargement ratios until you achieve a texture screen that has obvious grain—that is—grain structure that is obvious to the eye. Once the correct exposure has been found, through test-strip printing, at least three such screens should be made in the event that one may become damaged or dirty through use.

THE EASEL

A special enlarging easel will be required. Actually, it is nothing more complicated than a piece of $\frac{3}{4}$ -inch plywood measuring 12x12 inches and painted flat black. After the easel has been painted and allowed to dry, small rubber legs should be glued to each of the four corners underneath the unit. The rubber legs (available at any hardware store) will prevent the easel from slipping on the enlarger's baseboard.

Finally, place a sheet of color print paper or film on top of the easel (I'll explain later how the process can be used to make ordinary color prints or oversized transparencies), and using ordinary masking tape, build up an "L"-shaped structure in one corner (see illustration). Layers of masking tape should be used until they are equal to the thickness of the printing material being used. The reason for this will be apparent in a moment.

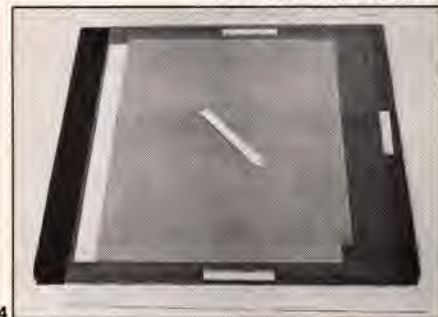
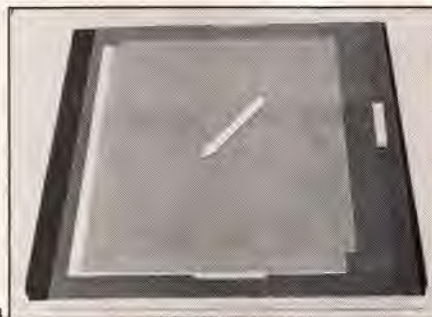
Finally, obtain a sheet of clear, flaw-free glass that measures some one or two inches larger than the grain texture screen. Clean the glass carefully and then tape the texture screen to one side of the glass. Use masking tape to achieve this requirement. In use the glass will be placed, texture screen down, over the piece of paper or film on the easel. The "L"-shaped configuration will safely hold the film or paper in the proper position and will also allow the glass/texture screen assembly to "float" over the film or paper without undue binding or drag. In actual use under the enlarger the glass/texture screen assembly will be moved twice.

THE FILTERS

The actual process used to achieve the pointillism effect is a form of color printing known as tricolor or additive



ALL PHOTOS BY THE AUTHOR



1. After the plywood easel is painted dead black, masking tape is used to define an "L"-shaped configuration in one corner. The tape is applied in layers until it is as thick as the sensitive film or paper that will be used.

2. The oversized grain texture screen is carefully taped to a piece of flaw-free glass. In use the texture screen comes in contact with the emulsion of the film or paper by using the glass assembly upside down.

3. After the first red filter exposure, the red filter is removed, the green filters inserted, and the glass with the texture screen is slipped laterally to the left by $\frac{1}{4}$ inch for the second exposure.

4. After the green exposure, the green filters are removed, and the blue filters inserted. Then the glass/texture screen assembly is slipped laterally to the right $\frac{1}{4}$ inch, and the final exposure is made. The three separate exposures through the grain texture screen create the pointillism effect.

color printing. In this process, one does not use ordinary subtractive filters (cyan, magenta and yellow); one uses the additive primaries (red, green and blue). Although there are a number of commercially available units that fit onto the enlarging lens and provide the necessary three colors, I have found that the ordinary color separation filters do not satisfactorily render the type of color saturation that I like. Although these units are more than satisfactory for making ordinary color prints, I do not recommend their use for this process.

Instead, I found that common theatrical gels were much more satisfactory, providing a degree of color saturation that others filters do not permit. The gels I used can be obtained from Olesen Company, 1535 Ivar Avenue, Hollywood, California 90028. The gels are manufactured by Lee Filters, Ltd., and are identified as red No. 106, green No. 124 and blue No. 142. The gels are available in sheets measuring 21x24 inches. Each sheet sells for \$3.40, and you must

include five percent of the total purchase price for handling and shipping. If you buy the three sheets for a total of \$10.20, be sure to include 51¢ for postage and handling.

Now this is important: The red filter is used singly, but the blue and green filters are used *doubled*—that is, two pieces of green and blue filter material instead of one. The filters can be cut to fit your filter drawer, or you can construct a device for holding them under the enlarging lens. Such a device can be seen in a book recently published by PhotoGraphic magazine titled *Photographics* by Robert D. Routh (Petersen Publishing Company, \$3.95); the construction of the device can be found on pages 62 and 63.

THE PROCEDURE

Because this is a negative-to-positive process, a color negative will be required. If you use color slide film, then a color internegative will have to be made from your slide. Such internegatives can be supplied by your local processor as a service by Eastman Kodak for a nominal cost.

Once the color negative (or color internegative) has been obtained, it is placed in your enlarger's negative carrier, and the image projected onto the easel. A sheet of paper cut to the final size of the print will serve as a focusing target.

Stop down the enlarging lens to your usual working aperture and insert the red filter into the filter drawer (along with the usual heat-absorbing glass and ultraviolet filter). If you are using a homemade device that holds the filters under your lens, place the red filter in position. Set your timer for 10 seconds

New Vivitar Series 1 90mm f2.5 macro lens



The Vivitar Series 1 90mm f2.5 macro lens may well be the sharpest lens in 35mm photography. The lens utilizes the floating group concept to maintain optimum performance throughout its focusing range. Tests for resolution and contrast from infinity to life-size (1:1 reproduction) give the Series 1 90mm f2.5 lens some of the highest overall axial to corner ratings obtained for macro lenses.

A 90mm macro lens yielding good performance could have been produced using a normal double Gauss design. To achieve and maintain very high levels of performance from infinity to life-size, however, Vivitar Series 1 designers used a unique 8 element/7 group configuration to bring aberrations to an absolute minimum and to stabilize them throughout focusing distances from a reproduction ratio of 1:2 to infinity. The extremely stringent performance demands to eliminate aberrations in the lens also required the use of optical glass of a very high index of refraction and some uncommonly thick elements.

Using the concept of a null lens, borrowed from astronomical optics, the designers created a 3 element macro

corrector-lens adapter that achieves a true flat-field image, high resolution and excellent contrast in the 1:2 to 1:1 reproduction range. The macro corrector-lens adapter is not a magnifying lens. Its sole function is to compensate aberrations produced when the lens is moved away from the film plane for life-size photography.

The selection of 90mm as the focal length of this lens provides two distinct benefits to photographers. It is an ideal focal length for portraiture and general purpose photography. When used with its macro adapter the lens allows life-size photography at a greater working distance from the subject than shorter focal length macro lenses. This greater working distance increases the photographer's options in illuminating macro subjects and lessens chances of disturbing live subjects.

As with all Vivitar Series 1 lenses, the mechanical configuration has been as carefully engineered and manufactured

as the optics. The lens engravings give the photographer maximum information and legibility. The lens barrel styling is entirely functional, all controls being placed in the most appropriate positions for precise, comfortable operation.

Optical Specifications

Elements/Groups:	8 elements, 7 groups.
Main lens:	3 elements, 3 groups.
Macro Adapter:	VMC Vivitar multicoating.
Lens coating:	
Angle of acceptance:	27°
Aperture range:	f2.5 to f22
Minimum focus distance from film plane:	39.3cm (15.5 in.) without Adapter, 35.5cm (14 in.) with Adapter
Maximum reproduction ratio:	1:2 without Adapter, 1:1 with Adapter.



Mechanical Specifications

Length at infinity:	90mm (3.5 in.) without Adapter, 138mm (5.4 in.) with Adapter
Maximum barrel diameter:	70mm (2.8 in.)
Weight:	
Main lens:	644 gms. (23 oz.)
with Adapter:	936 gms. (33 oz.)
Filter size:	58mm
Lens case:	Semi-hard, 2 compartment case.

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The
people
color

TRICOLOR POINTILLISM

and turn off the room lights. Place a piece of color print paper or film onto the easel, butting the edges firmly against the "L"-shaped masking tape edges and cover the assembly with the piece of glass onto which the grain texture screen has been taped. The texture screen should be in contact with the sensitive emulsion. Make an exposure.

Again, in the dark, remove the red filter from the filter drawer and insert the green filters or position the green filters under the lens. *Carefully move the texture screen assembly laterally to the right about 1/4 inch and make the second exposure.* Still in the dark, remove the green filters and insert the two blue filters into the filter drawer or position the blue filters under the enlarging lens. *Carefully move the texture screen assembly laterally to the left about 1/4 inch and make the final exposure.*

Process the exposed paper or film according to the manufacturer's directions. If you are using Kodak's color print film, it will be necessary to process the film in C-22 developer. If you are using color print paper, the process you usually use will be satisfactory.

Assuming the exposures have been made correctly (they will probably require adjustment), you will have a perfectly exposed and color-corrected print that seems to be entirely composed of dots of color. As each exposure was made through the texture screen, certain areas of the sensitive material were exposed and others were not. Successive exposures and the moving of the texture screen between exposures account for the final pointillism effect.

Now, assuming the color balance and exposures were not correct, adjustments in the three exposures will have to be made. I use a system devised by John Scott for my tricolor printing, and I'd like to detail the process for you. It is accurate, easy and results in near-perfect prints.

TRICOLOR PRINTING

If the color balance seems correct, but you wish to change the overall density of your prints to either lighten or darken your results, take a look at "Chart 1." The use of the chart is self-explanatory. However, assuming, as an example, that your print was one-stop overexposed (value judgments have to be made until one is familiar with the process) and you

CHART 1		
TO CHANGE PRINT BY:	TO LIGHTEN PRINT MULTIPLY ALL THREE EXPOSURES BY	TO DARKEN PRINT MULTIPLY ALL THREE EXPOSURES BY
1/2 stop	.67	1.5
1 stop	.50	2.0
1 1/2 stops	.33	3.0
2 stops	.25	4.0

In using the above chart a value judgment must be made concerning the relative density of the finished print. See text for full details.

CHART 2 SHIFT IN PRIMARY RED, GREEN OR BLUE		
DENSITY SHIFT	MULTIPLY THE EXCESS PRIMARY COLOR BY	MULTIPLY REMAINING PRIMARIES BY
.10	1.17	.96
.20	1.36	.86
.30	1.58	.80
.40	1.85	.74
.50	2.16	.68

To determine the amount of color imbalance requires experience. However, a "slight" color error could be likened to a .10 density shift; a "moderate" color error could be likened to a .20-.30 density shift, and a "heavy" color error could be likened to a .40-.50 density shift. See text for full understanding of how to use the chart.

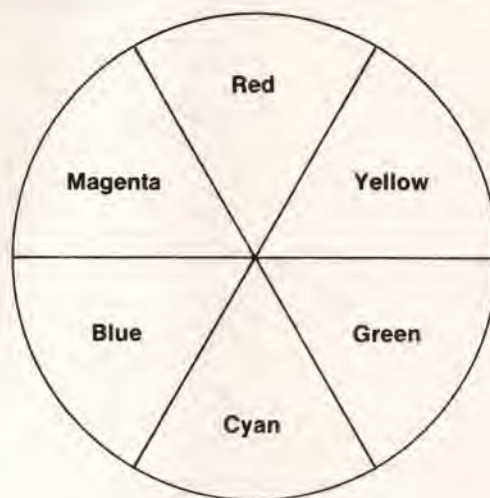


CHART 3 SHIFT IN CYAN, MAGENTA OR YELLOW		
DENSITY SHIFT	MULTIPLY EACH OF THE TWO PRIMARIES TO EACH SIDE OF THE EXCESS COLOR BY	MULTIPLY REMAINING PRIMARIES BY
.10	1.08	.93
.20	1.17	.74
.30	1.26	.63
.40	1.36	.54
.50	1.46	.46

Check color wheel to determine color error and the two primaries on each side of the error. The primaries are then multiplied by factors given above. See text for full explanation.

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TRICOLOR POINTILLISM

wished to reduce the overall density, then according to the chart, you'd multiply all three original exposures (10 seconds through each filter) by a factor of .50. Then the next three series of exposures would call for five-second exposures through each filter.

If the color balance is incorrect, there are two charts to be used. One defines the color imbalance as red, green or blue, the other for cyan, magenta or yellow. For the purpose of this discussion refer to "Chart 2" and assume the density of the print is accurate, but the print appears to be too red. In Chart 2, the density errors are defined in units from .10 to .50. A "slight" error would be on the order of .10 density; a "moderate" error would be on the order of .20 to .30, and a "heavy" error would be on the order of .40 to .50. Let's assume the print is .30 too red. According to the chart, you'd multiply the original red exposure of 10 seconds by a factor of 1.58 for a new red exposure time of 15.8 seconds. If your timer is one of the new solid-state devices such as the E.P.O.I. Digitrol, you can easily set the requirement. If your timer is not so sophisticated, you can round off the exposure to the nearest full second.

Next, correct the exposures for the green and blue filters by multiplying the original 10-second exposures by a factor of .80 according to the chart for new exposure times of eight seconds each for the green and blue filters. The next print should be right on the money.

If the color error is cyan, magenta or yellow, "Chart 3" should be used. When using Chart 3, you must first refer to the color wheel which accompanies the chart. As an example, let's assume the print is .20 too magenta. Looking at the color wheel, it can be quickly determined that the magenta indication is flanked on either side by the red and blue segments. Therefore, according to Chart 3, you would have to multiply the original red and blue filter exposures (10 seconds) by a factor of 1.17 for new exposure times of 11.7 seconds for the red and blue filters. The remaining primary, green, should have its original exposure time multiplied by a factor of .74 for a new green filter exposure time of 7.4 seconds. The next print will show the needed color correction.

What if both color balance and

exposure are off? Well, according to the Scott method of tricolor printing, you would have to add one extra step of color compensation for each 1/2 stop of underexposure, and you'd have to subtract one extra step of color compensation for each 1/2 stop of overexposure. This means that if the original test print was one-stop overexposed and was also adjudged to be .30 too red, you would first have to multiply the original 10-second exposures by the factor .50 to obtain the new exposure times to lighten the print by one full f-stop. This would amount to new exposure times of five seconds for each filter.

Then, looking at Chart 2, you would have to determine that the .30 red compensation would have to be reduced by two full density units to one step of red correction because of the need to subtract one density unit of color compensation for each 1/2 stop of overexposure correction. This would require you to multiply the new red exposure time of five seconds by a factor of 1.17 and the remaining two primaries by a factor of .93. This would result in new exposure times (rounded off to the nearest .10 second) of red—5.9 seconds; green—.5 seconds, and blue—.5 seconds. When a second print is made, both the color balance and density would have been corrected.

Although this system may appear complicated at first, you will discover how truly simple it is when you begin to work with it in your own darkroom. However, be advised that it is vitally important to keep written records of exposure times for each filter. Also, it is advisable to keep records of the final exposure times for future prints.

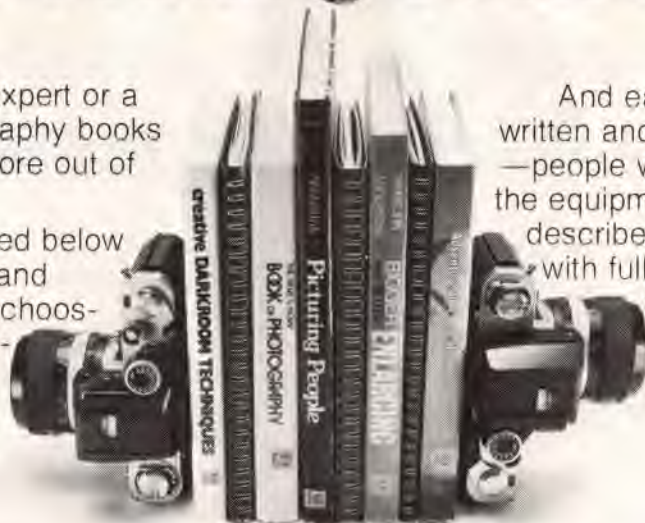
The final step is to color spot the finished print or transparency. Spotting colors for this purpose are made by Kodak and can be obtained at any reasonably stocked camera store.

The finished pointillism print represents a most unusual graphic product with many commercial applications such as record covers, posters, etc. For my own work I prefer to use Kodak's color print film. This results in a large transparency from which I can have another internegative made. The resulting internegative allows me to make as many prints as I need without the need for exposing individual prints, and I can also make giant, posterlike prints for exhibition, sale or whatever else comes along in the day-to-day life of any working professional. □

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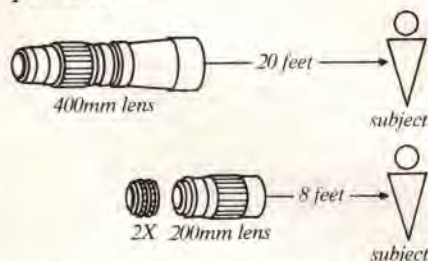
Vivitar Tele Converters double or triple the focal length of your lens...inexpensively.

Vivitar 2X and 3X Automatic Tele Converters are surprisingly inexpensive alternatives to buying telephoto lenses. A Vivitar Tele Converter may appear to be a fairly simple device, but in reality it's a sophisticated optical and mechanical instrument and a fine lens in its own right. That's what

works just as it would if you weren't using a Vivitar Tele Converter.

The most popular reason for using Vivitar 2X and 3X Tele Converters is the low cost. That's because suggested retail prices range from only \$29.50 to \$54.50 depending on the camera they're

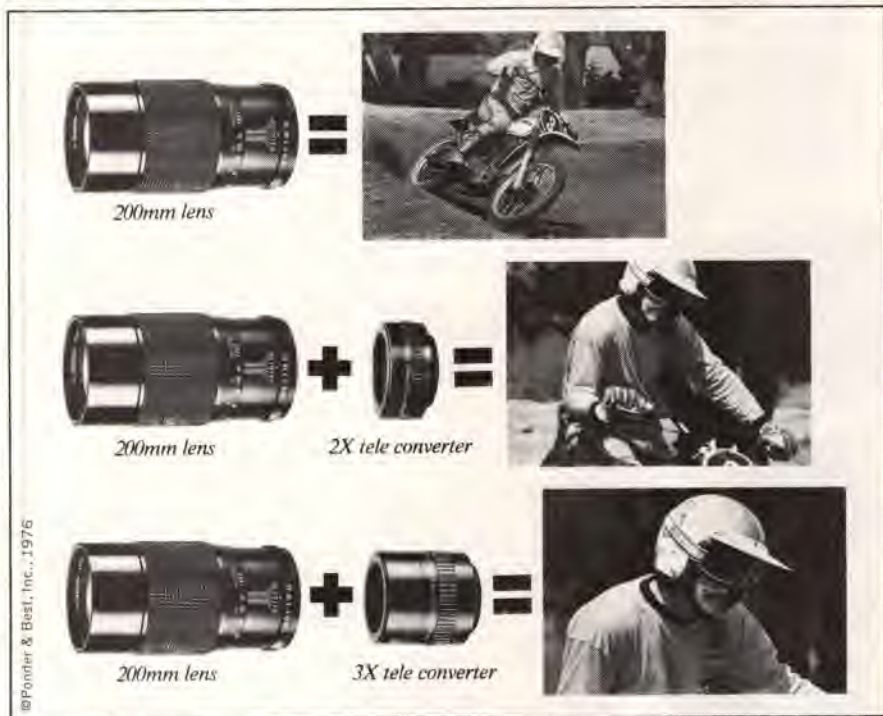
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There's a Vivitar Tele Converter for most popular 35mm SLRs: Nikon, Nikkormat, Canon, Pentax S, Mamiya Sekor, *Exakta, Minolta, Olympus OM-1 & OM-2, Konica, *Miranda, *Topcon, and Vivitar.

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made to fit and whether they're 2X or 3X. But there are other reasons for using Tele Converters. Professionals, carry Vivitar Tele Converters for the convenience. A Tele Converter takes up much less room and weighs far less than big telephoto lenses.

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BLUEPRINT SERIES

How To Make a Photo Mural

BY WALT SENG

PROJECT: To make a photo mural using devices described in the August and September, 1976 "Blueprints."

PURPOSE: To provide an easy and inexpensive method for making mural-size prints in your modest-size darkroom.

EQUIPMENT: 1. Kodak Photo-Mural Paper, single-weight, R-2 or R-3 (normal and contrasty), 42-inch by 30-foot roll; 2. Right-angle print projection device for use with enlargers with nonrotating heads such as the Omega brand (see August, 1976 "Blueprint"); 3. Photo-mural easel (see September, 1976 "Blueprint"); 4. Maxwell Photo-Mural Tank for processing prints up to 30x40 inches [available from photo dealers or write Maxwell Photo-Mural Tanks, 999 E. Valley Blvd., Alhambra, California 91801, telephone (213) 289-1098]; 5. 36-inch rule; 6. Sharp knife; 7. Single-blade squeegee, photo sponge or chamois; 8. Large, smooth, waterproof surface on which to squeegee prints before drying, such as Plexiglas or Formica on hardboard; 9. Large screen or clothesline and clips for drying prints; 10. Large piece of opaque board for making test prints; 11. Dodging and burning-in tools.

PROCEDURE: Prepare your enlarger for vertical easel projection by rotating head or using right-angle device mentioned above. Position easel about four feet from enlarger. Insert negative into enlarger. (When using right-angle device, put negative in carrier emulsion-side up because mirror reverses image.)

Affix piece of 32x42-inch white paper to easel. Turn off room lights and turn on enlarger; position easel for desired cropping. When focusing, turn off safelight for better visibility. Be certain your easel is squared up with the enlarger. Be especially careful if you're using right-angle mir-



1. Measure photo-mural paper (32 inches) prior to trimming.



2. Trim paper with knife using edge of box as guide.

ror device. If everything is squared up, your image will be sharp throughout the print.

With the safelight on measure and cut the photo-mural paper. An easy way to do this is to keep the roll in the box while unrolling and measuring off a 32-inch piece. Cut paper with sharp knife using edge of box as guide. (See photos No. 1 and 2.)

Position paper on easel (see photo No. 3) and make a test print in the usual manner using the large piece of opaque board. Set your timer for 30 seconds and expose the test print up to a total time of five minutes (in stepped incre-

ments). (My exposure time for print illustrating this article was two minutes, 45 seconds at f/8.) Process the test print as outlined in the Maxwell information sheet. I found the use of a wetting agent in the presoak unnecessary. A two-minute soak in tap water worked fine. In addition, my developer dilution and time were different than Maxwell's instructions. Instead of Dektol 1:4 at four minutes, I achieved excellent results using Dektol 1:3 for three minutes at 75°F.

A stop-bath is highly recommended to prevent excessive amounts of developer from being carried over into the fix.

Fix normally, then rinse several times in water using a rapid wash solution such as Perma-Wash for three to five minutes. Give a final wash of not less than five minutes in the tank or tub with a sufficient flow of water (Photos No. 4 through 7 show use of Maxwell Photo-Mural Tank).

Lay washed print on large, flat surface and squeegee or sponge off excess water (see photos No. 8 to 10).

Evaluate the test print for the best exposure, and following the above procedures, make a final print. Do not discard test print; it will be used in the mounting process to be detailed in an upcoming "Blueprint."

GENERAL DISCUSSION: The cost of the Maxwell Tank is \$25 for the 30x40-inch size, plus postage (and worth every penny). The photo-mural paper should be ordered through your photo dealer. Most likely, it will not be in stock. Current cost is \$32.15. The combined cost of the tank and paper is about equal to the cost of a commercially made photo mural. Per print cost is roughly \$3.25—a real bargain.

Photo-mural paper is quite durable and will take a bit of rough handling. Minor creases and curl can be removed in the mounting process. However, this does not imply that it can be abused.

For utmost print quality your negative should be of optimum quality—minimum exposure to insure good shadow detail and proper development. A too dense negative causes two problems—much grain in the print and excessive printing times. If you have a good image on a too dense negative, it's advisable to make a smaller print and have a high quality copy negative made before making a mural-size print. This procedure won't eliminate grain, but it will make your printing a lot easier. The negative from which the test print illustrating this article was made was ex-

ALL PHOTOS BY THE AUTHOR



3. Affix photo-mural paper to easel with pushpins.



5



4-7. Prepare exposed paper for processing in Maxwell Photo-Mural Tank.



6



7



8. Squeegee excess water from photo prior to drying.



9. Clip photo to clothesline for drying.



10. Place photo on large screen to dry.

posed on Kodak Plus-X Film exposed normally and underdeveloped 15 percent for printing on R-3 paper. There is virtually no grain to speak of from the 2½x2½ negative. Sharpness is excellent throughout.

I cannot overemphasize the joy of making your first mural-size photo. This has been my

first experience with making such large prints, and I found there is nothing to fear when making prints of such formidable dimensions. I made a test print and three final prints in less than three hours! Finally, a note of thanks to Mr. Hugh Maxwell for his amazingly versatile and efficient processing tanks. © Walt Seng, 1976 □

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CAMERA: Nikon F2 with 85mm Nikkor lens
 FILM: Kodak Tri-X, developed in Kodak D-76
 USE: Assignment for ABC Television News for use in TV GUIDE

JIM WOOD: A GRAPHIC CHRONICLE

□ Usually when we think of what an advertising photographer does, we visualize superslick photographs of products and glamorous models. Breaking out of that conceptual trap with consummate success, Jim Wood puts a personal stamp on his photo ads, posters and packages. He attempts to create pictures that people will feel rather than just see. To accomplish this Jim admits to being influenced by many schools of painting—Cubism, Expressionism, Surrealism and Pointillism. But rather than just copying the style of the greats, Jim looks to their philosophy of seeing to find inspiration for his photography.

Those inspirations have resulted in images that are singularly provocative. Few artists are able to create visual symbols that so readily encapsulate our feelings. His themes are emotion-laden segments of common experience and knowledge—a teenager in the '50s, a

boy with his father in the '20s, a family out to dinner in a small-town cafe, a scientist at work or a young couple in their first apartment. Jim's ability to lend graphic reality to those memories and notions that many people share is in large part the value the advertising industry recognizes in his talent.

And to his fellow photographers Jim's work is significant as a model of encouragement: self-expression with the camera can result in photographs that not only embody skill, craftsmanship and artistic expression but also bring forth undeniably warm and pleasurable feelings for those who see them. Jim Wood is an enthusiastic photographer as much dedicated to producing significant pictures as he is to achieving professional success. His work should inspire us all to believe that fine photography can please and entertain the broadest possible audience. □



CAMERA: Nikon F2 with 24mm Nikkor wide-angle lens
FILM: Kodak 2475 Recording, developed in Kodak HC-110
USE: Poster for Sun Maid raisins

JIM WOOD



CAMERA: Nikon F2 with 24mm Nikkor wide-angle lens
 FILM: Tri-X, developed in D-76
 USE: Bank in Georgia



CAMERA: Nikon F2 with 28mm Nikkor wide-angle lens
 FILM: Tri-X, developed in D-76
 USE: Advertisement for bank in Georgia

JIM WOOD



CAMERA: Hasselblad with 80mm Zeiss lens
FILM: Kodak Royal-X Pan, developed in HC-110
USE: Franciscan china and self-promotion



CAMERA: Nikon F2 with 20mm Nikkor wide-angle lens
FILM: 2475 Recording, developed in HC-110
USE: Personal



CAMERA: Nikon F2 with 85mm Nikkor lens
FILM: 2475 Recording, developed in HC-110
USE: Advertisement for Shell Oil Company



CAMERA: Hasselblad with 120mm Zeiss lens and cross-screen filter
FILM: Kodak Verichrome Pan, developed in D-76
USE: Advertisement for 1921 Jewelry Company

JIM WOOD



CAMERA: Nikon F2 with 35mm Nikkor wide-angle lens
 FILM: Tri-X, developed in D-76
 USE: Poster for Baskin & Robbins ice cream



CAMERA: Hasselblad with 50mm Zeiss wide-angle lens
 FILM: Kodak Ektachrome-X developed in C-22 to a negative, then printed on black-and-white paper
 USE: Set of animated stills for television commercial film

JIM WOOD



CAMERA: Hasselblad with 50mm Zeiss wide-angle lens
FILM: Tri-X, developed in D-76
USE: Personal



CAMERA: Nikon F2 with 20mm Nikkor wide-angle lens
FILM: Tri-X, developed in D-76
USE: Self-Promotion

Turn your imagination loose with lenses that let your instincts speak. For photographs that turn expressions like "confined space", "horizons" and "distance" into your artistic tools, there are two very special Sigma lenses: the 16mm f/2.8 full frame fisheye and 500mm f/8 mirror-telephoto.

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Photographic's SPEC SHEET

LENS: Celestron 750mm f/6
Multipurpose Mirror Telephoto



ANGLE OF VIEW: 3.3°
NUMBER OF ELEMENTS: 3
ACCESSORY SIZE: Series VI
APERTURE RANGE: Fixed, f/6
FOCUSING RANGE: 15 feet (4.6 meters) to infinity and beyond for special scientific applications
CLOSE FOCUS MAGNIFICATION: 1:5.1
DEPTH-OF-FIELD SCALE: None
INFRARED FOCUS MARK: None
LENS COATING: Optional; magnesium fluoride can be applied for an additional \$50, which will increase transmission by 15 percent
WEIGHT: 4 pounds (1.8kg)
FINISH: Black, pebble-grain vinyl; spattered enamel; anodized aluminum
LENGTH FROM FRONT TO FLANGE AT INFINITY: 11 inches (27.9cm)
MAXIMUM BARREL DIAMETER: 5.75 inches (14.6cm)
CLICK STOPS: None required
ROTATION DIRECTION FROM INFINITY TO CLOSE-UP, IN USE: Nonrotating mount
BUILT-IN LENS HOOD: None required
SPECIAL FEATURES: Full internal baffling; large micrometer focusing knob; converts to visual telescope with optional accessories
MOUNTS AVAILABLE: Nikon, Minolta, Pentax, Canon, Olympus OM, Miranda, Exakta, Konica, Alpa, Petri
PRICE: \$445 with front and rear lens caps, tripod foot, carrying case
DISTRIBUTOR: Manufactured by Celestron International, 2835 Columbia Street, Box 3578-SS, Torrance, California 90503

LENS: Celestron 1250mm f/10
Multipurpose Mirror Telephoto



ANGLE OF VIEW: 1.9°
NUMBER OF ELEMENTS: 3
ACCESSORY SIZE: Series VI
APERTURE RANGE: Fixed, f/10
FOCUSING RANGE: 20 feet (6.1 meters) to infinity and beyond for special scientific applications
CLOSE FOCUS MAGNIFICATION: 1:3.8
DEPTH-OF-FIELD SCALE: None
INFRARED FOCUS MARK: None
LENS COATING: Optional; magnesium fluoride can be applied for an additional \$50, which will increase transmission by 15 percent
WEIGHT: 3 pounds, 14 ounces (1.76kg)
FINISH: Black, pebble-grain vinyl; spattered enamel; anodized aluminum
LENGTH FROM FRONT TO FLANGE AT INFINITY: 13 inches (33cm)
MAXIMUM BARREL DIAMETER: 5.75 inches (14.6cm)
CLICK STOPS: None required
ROTATION DIRECTION FROM INFINITY TO CLOSE-UP, IN USE: Nonrotating mount
BUILT-IN LENS HOOD: None required
SPECIAL FEATURES: Full internal baffling; large micrometer focusing knob; converts to visual telescope with optional accessories
MOUNTS AVAILABLE: Nikon, Canon, Minolta, Pentax, Olympus OM, Miranda, Exakta, Konica, Alpa, Petri
PRICE: \$495 with front and rear lens caps, tripod foot, carrying case
DISTRIBUTOR: Manufactured by Celestron International, 2835 Columbia Street, Box 3578-SS, Torrance, California 90503

LENS: Celestron 2000mm f/10
Multipurpose Mirror Telephoto



ANGLE OF VIEW: 1.2°
NUMBER OF ELEMENTS: 3
ACCESSORY SIZE: Series VI
APERTURE RANGE: Fixed, f/10
FOCUSING RANGE: 25 feet (7.6 meters) to infinity and beyond for special scientific applications
CLOSE FOCUS MAGNIFICATION: 1:2.8
DEPTH-OF-FIELD SCALE: None
INFRARED FOCUS MARK: None
LENS COATING: Optional; magnesium fluoride can be applied for an additional \$75, which will increase transmission by 15 percent
WEIGHT: 11 pounds, 4 ounces (5.1kg)
FINISH: Orange baked enamel tube; brown spattered enamel castings
LENGTH FROM FRONT TO FLANGE AT INFINITY: 19 inches (48.3cm)
MAXIMUM BARREL DIAMETER: 9 inches (22.9cm)
CLICK STOPS: None required
ROTATION DIRECTION FROM INFINITY TO CLOSE-UP, IN USE: Nonrotating mount
BUILT-IN LENS HOOD: None required
SPECIAL FEATURES: Full internal baffling; large micrometer focusing knob, 6x30 finder scope, converts to visual telescope with optional accessories
MOUNTS AVAILABLE: Nikon, Canon, Minolta, Pentax, Olympus OM, Miranda, Exakta, Konica, Alpa, Petri
PRICE: \$575 with front and rear lens caps, tripod foot, 6x30 finder scope, carrying case
DISTRIBUTOR: Manufactured by Celestron International, 2835 Columbia Street, Box 3578-SS, Torrance, California 90503

The incredible Pentax KX:



Think of it as five great cameras in one.

... because it takes that many of the world's finest cameras to produce the combination of top features found in a single KX.

You can check this out yourself and if you're beginning to think the recent technological advances in 35mm are something you can't live without much longer ... it would be rewarding research.

Let's take a look at that claim ...

A perfected bayonet-mount

You can get a bayonet-mount on any number of fine 35mm SLRs. But only one other fine camera has raised locator nodes like the KX. You can change lenses without looking ... even in the dark. And fast ... the Pentax bayonet-mount locks lenses

in place in less than a quarter turn.

Metering a pro would love

The KX's metering is center-weighted, with very fast silicon photo diodes. There are four other cameras that have silicon photo diodes. But not one of them is in combination with the perfected



bayonet-mount of the KX.

Full disclosure viewfinder

There are three cameras that show you both f/stop and shutter speed in their viewfinders. But only the KX gives you a single aperture number, plus match-needle metering superimposed over the shutter speed scale for faster, easier operation.

Coating on every lens surface

Every lens surface on the KX (like all Pentax cameras) is super-multi-coated. No other fine camera pays such attention to this detail.

Silver-coated pentaprism

The Pentax KX has a silver-coated pentaprism for brighter viewing. One other fine camera also has this fea-



ture but this camera does not show you aperture in the viewfinder.

And even more

Even if you could jam those five great cameras into one . . . it would still fall short of a KX. Balance, feel, responsiveness, elegance and yes . . . a fair price. They all get nicely together in one superb unit . . . KX.

The Pentax K-series (there are

three cameras) is a total system with over 200 matched accessories available right now. What's more, Pentax also has available a low-cost K-adapter that lets you use any existing Pentax screw-mount lens with your new K-series camera.

The Pentax KX: It's just like having five great cameras in one. See your Pentax dealer and check the KX out

for yourself . . . bet you like it. We'll send complete details if you write to: Honeywell Photographic, P.O. Box 22083, Dept. 204-877 Denver, CO 80222.

Honeywell Photographic

□ The photographs on these pages were taken by photographers of professional caliber. If you feel your photographs are of similar quality, send us the evidence (along with a stamped, self-addressed return mailer—in case we don't agree). *PhotoGraphic* will consider either black-and-white or color photographs submitted according to the following guidelines:

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Color—We will accept no more than five color transparencies from any photographer for consideration. To submit slides, print your name on each slide mount, and enclose all equipment and exposure information on a separate piece of paper. Color prints must be at least 3½x4¼ inches in size on glossy paper.

Also, for any photograph in which a person or persons can be identified, the picture must be accompanied by a signed release from each recognizable individual. *PhotoGraphic* will pay \$25 for each picture published. Prints and transparencies are accepted for one-time use and will be returned after publication date. □



1. Ronald L. Rogers made this abstract close-up of a rusty paint can with a Nikon F2 and 55mm Auto-Micro Nikkor lens. He reduced camera vibration to retain sharp detail by mounting the camera on a tripod with the mirror locked up. The photograph was made on Kodak Kodachrome 25 Film, and exposure was not recorded.

2. Intrigued by the design made by the arches on this building, Nadine Etkes photographed the scene with a Nikon F, 50mm Nikkor lens and Kodak Kodachrome 64 Film, exposed for 1/125 at f/11.

3. Martin Wolin, Jr. captured the expressive face and gesture of his subject with a Minolta SR-T101 and 21mm MC Rokkor-X lens. Agfa Agfachrome 64 Film was rated at ASA 80 and exposed for 1/60 at f/8.

4. Ward Roberts photographed this abstract design with a Pentax Spotmatic F and 52mm SMCT close-up lens. Exposure, made on Kodachrome 64 film, was not recorded.

5. The motion of these bicyclists competing in a close race was captured by Alex Koleska, who photographed his subjects with a Nikon F and 135mm Nikkor lens. Exposure, on Kodak Ektachrome-X Film, was for one second at f/22.

COLOR GALLERY '76





3



5



4



GALLERY '76





1. A fortuitous juxtaposition of subject and the back page of the magazine she's engrossed in resulted in an entertaining sight. Phyllis Ewen saw the humor in the scene and documented it with a Minolta Autocord twin-lens reflex camera, 75mm Minolta lens and Kodak Tri-X Film, exposed for 1/250 at 1/11. Lighting was strobe bounced from umbrella.

2. Mike Chickey bought his young son "a camera he could grow into" and photographed the boy's attempts at picture making with a Leica M4 and 35mm Summicron lens. Camera loaded with Tri-X film; exposure not recorded.

3. Larry Maver photographed his friends, Pedro and Beaner, a pair who obviously think they're the cat's meow in their elegant garb. Maver took the picture with a Minolta Autocord 2 1/4 x 2 1/4 loaded with Tri-X film, exposed for 1/25 at 1/16.

4. "He followed me home, Mom," is the caption Frank J. Piplen supplied for this improbable photo taken with a Retina IIic and Schneider-Xenon 50mm 1/2 lens. Piplen took the picture near Rapid City, South Dakota, on Kodak Plus-X Film, and the exposure was not recorded.

5. These *objects d'art* and their guardian were photographed by Bruce Barr, who used an Asahi Pentax and 50mm Super-Multi-Coated-Pentax lens to record the fragmented scene. Ilford FP4 Film was exposed for 1/30 at 1/5.6.



NUTS & BOLTS

The idea isn't new—in fact, one manufacturer makes an edge light for its super size cutting board—but that's no reason why owners of smaller cutting boards or boards with pivoting knives can't enjoy the same convenience for a lot less money.

Mount a 15-inch fluorescent light fixture on the edge of a plywood panel slightly larger than your cutting board. Glue or nail two strips of pine to the plywood (2x2 pine should be about right) in line with the rubber feet on the underside of the cutting board.

Bore slightly oversized holes in the pine strips as required for your board so that the feet drop into the holes to hold the cutting board alongside the fluorescent tube. The cutting board is not fastened, so it can be lifted out of the holes readily for cutting without the light.

For cutting irregular shapes, following lines drawn on paper or trimming parallel to a line, turn on the fluorescent light and slide the paper around until the cutting line coincides with the distinct shadow of the metal cutting edge as outlined by the light. The cut will follow the shadow line precisely. □ 3

FLUORESCENT FIXTURE FOR YOUR PAPER CUTTER

By Herbert Pfister



1. Trim paper without guesswork on any type paper cutter mounted alongside a fluorescent light. Light defines shadow of cutting edge through paper, permitting you to cut precisely where you want without making guide marks at paper edges.

2. Crisp shadow line, about 1/4 inch above edge of photo, shows exactly where knife will cut. Press paper flat against cutting board surface for a sharp, distinct shadow.

3. Holes in 2x2 pine strips glued to plywood base receive cutting board's rubber feet to position it to fluorescent tube in an instant.

NUTS & BOLTS NUTS & BOLTS

LENS CASES FREE AT YOUR LOCAL BURGER STAND

By Herbert Pfister

Next time you stop in for "Two all-beef patties, special sauce, etc.," save the molded, foam-plastic containers the burgers are packed in to keep them fresh and warm. Given a fast rinse at home, these containers make terrific cases for storing extra enlarger or camera lenses. The cushiony but rigid plastic boxes keep lenses free from dust, and they don't absorb moisture as cardboard boxes often do.

Unfolded so that the two halves lay out flat, the boxes are also useful as parts trays when disassembling or cleaning equipment. Made with a snap catch that locks them tightly closed, the plastic boxes are just too handy to throw away. They even come in different colors (different kinds of burgers), letting you color code your gear. □



1. Dust free and dry, these molded hamburger containers stack neatly to store different focal length lenses.



2. Raised hinged lids show ample space inside for lenses mounted on lens boards. Top snaps shut for tight seal.

NUTS & BOLTS INDEX

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THE AMAZING DO-IT-YOURSELF PHOTOGRAPHIC KID-PLEASER

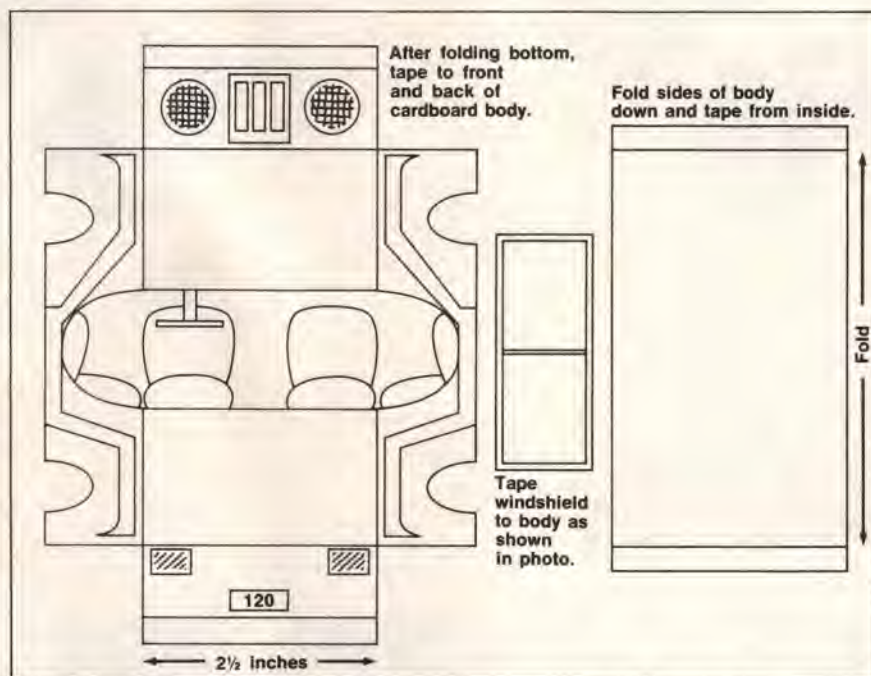
By Joe Greeves

Have you been feeling guilty lately about spending more time in the darkroom than with your kids? Have they taken to calling you the hermit who lives in the closet? For a small expenditure (to reproduce the artwork on this page) and a couple of 120 film reels, you can whip up this snazzy little buggy in less time than it takes to develop a roll of your favorite film and at the same time reestablish your family rating.

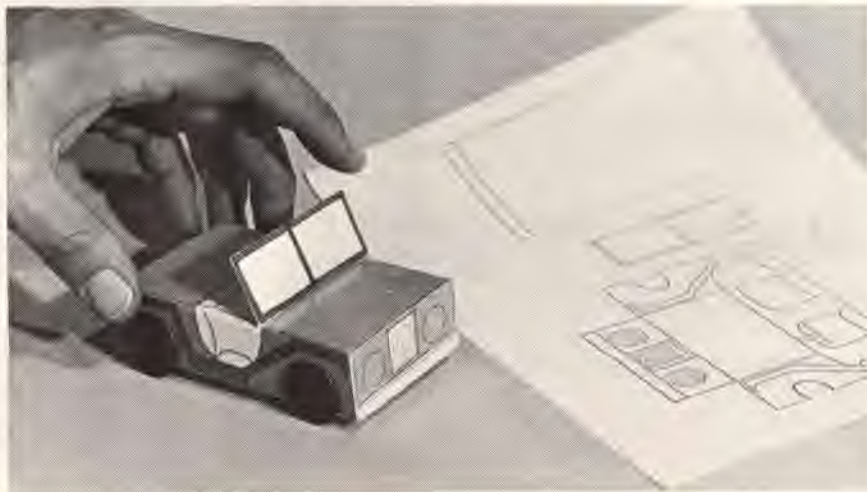
Construction couldn't be simpler. Use dry-mounting tissue to mount the copy of the page to a piece of cardboard. Add a dash of color with some felt-tip pens, then cut out the body, windshield and bottom. Fold the four sides of the body down and tape from the inside. Drop two reels from 120 roll film into the slots to act as wheels and axles, then tape the bottom in place. A strip of tape on the windshield and presto, there's nothing to it!

Now, suggest to your kids that using the same principle, they make a train complete from locomotive to caboose. You agree to provide the film reels and promise to stick your head out of the darkroom sometime! □

This little buggy is sure to be a hit with kids, and it's simple to make. A couple of reels from roll film, some tape and mounting tissue, and you're in business.



DIRECTIONS: After copying the above line drawing, make an enlargement exactly 4X the dimensions as shown, or make the enlargement so the given 2 1/2-inch dimension is realized.



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the new front-loading SCT-11 with Dolby on tape and FM.

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standard or CrO₂ tape. LED function indicators. Dual concentric recording level knob. And you get full Auto-Stop, plus automatic recording in mono, on both channels, when only the left channel is plugged in. Ask for 14-849, pay only 229.95 at participating stores, get the out-front deck that leaves others behind. Walnut grain vinyl-over-metal case included.

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NUTS & BOLTS FOCUSING BLOCK FOR DETERMINING CORRECT EXPOSURE FOR BELLOW EXTENSION

By Herbert Plister

Shooting close-ups with through-the-lens metering is a breeze—the exposure increase for the extended lens is automatically metered. But when I'm working close with my ground-glass press camera, I panic at the amount of mathematics needed to calculate the increase in aperture required for the extra bellows extension.

This little trick, published in Kodak's *Master Photoguide* but not demonstrated, gives me almost instantaneous exposure compensation by just holding a scale against the ground glass. Every close-up I take now includes a little



Two-inch-square wood block gives accurate exposure compensation when its image is measured on ground glass of press or view camera. Labels on block face aid in critical focusing.

two-inch square block of wood in the setup. After framing and focusing the shot, I measure the width of the block's image on the ground glass. If the image is $\frac{1}{4}$ inch wide, I open $\frac{1}{3}$ stop; $\frac{1}{2}$ inch wide, $\frac{2}{3}$ stop; $\frac{13}{16}$ inch wide, one stop; $1\frac{1}{8}$ inches wide, $1\frac{1}{2}$ stops; 2 inches wide, two stops; $2\frac{3}{4}$ inches wide, $2\frac{1}{2}$ stops, $3\frac{1}{8}$ inches wide, three stops.

This system provides "on-the-nose" exposures at virtually all bellows extensions with a minimum of effort. Also, don't forget to remove the block of wood from the photo setup before you shoot! □

BUILD A TUB-MOUNTED TRAY STAND

By Hubert Cox

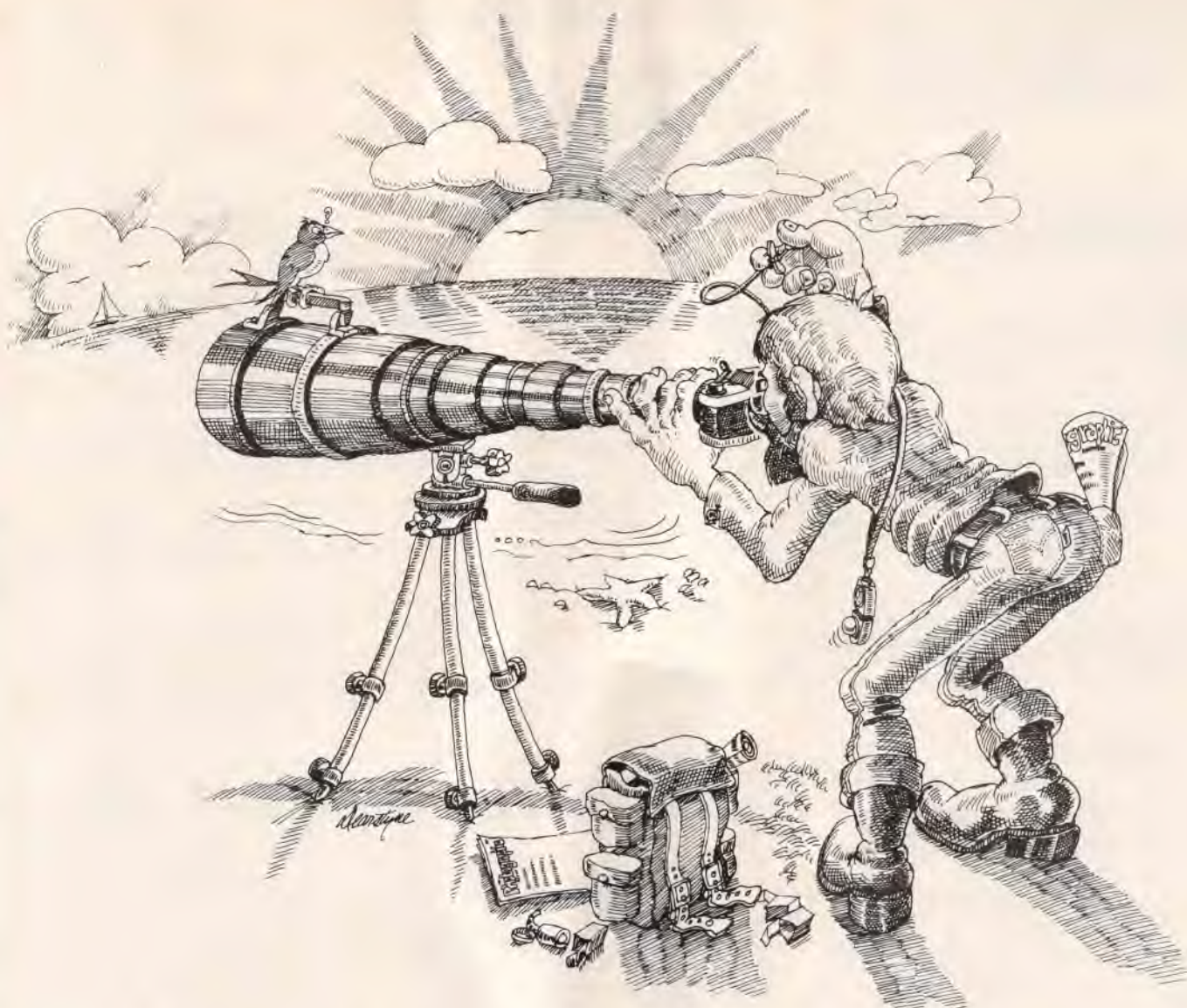
The bathtub can be used to provide more usable space for developing trays in your bathroom. A few pieces of plywood and scrap 2x4s will do it. Most lumber dealers have everything you need right in the odd-size bins. Tub measurements vary, but generally, 32-inch lengths will do, so try to pick boards as close to this dimension as possible. My own preference is $\frac{3}{4}$ -inch marine plywood, but rough plyscore will do just as well if you don't get too sloppy with liquids.

Here's what to get: 1. $\frac{3}{4} \times 11 \times 32$ -inch long plywood (2); 2. $\frac{3}{4} \times 23 \times 32$ -inch long plywood (2); 3. 2x4s, 13 inches long (4); 4. 2x4s, three inches long (3). Ends should be squared up on the 13-inch long pieces, as they are the columns for the boxlike structure. The short ones are nailed on the bottoms to keep the whole works from sliding out and dumping developer, stop and fix down the drain. These must be tacked lightly in place, tried and adjusted as needed, then fastened permanently.



1. 2x4 supports make developer and stop tray heights more comfortable when standing.
2. Cleat fastened to bottom keeps structure from sliding from side of tub.

The box may be used for short-time storage of jugs and chemical containers. I prefer to stand while watching prints develop—this is the reason for the double-decker. But you may not want to stand. In that case, omit one $\frac{3}{4} \times 23 \times 32$ -inch board and the four 13-inch long 2x4s. Also, one 22-inch board would replace the two 11-inch ones, but storage is simplified by using the narrower pieces. □



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NUTS & BOLTS

IS THERE A DARKROOM LURKING IN YOUR CLOSET?

By Joe Greeves

Maybe it's time to get the skeletons out of the closet and put your enlarger in! If you don't have a full-time working darkroom, where do you make your prints—the bathroom? Bathroom setups are alright, of course, but generally suffer from a terrible lack of privacy. Kitchens work, too, but only after you clear the counter or wash the dishes. Think how much better it would be if you didn't have to start from scratch each time.

In case no one ever told you, a darkroom is simply a *dark room*! If you've always wanted one but still don't have one, it may be your own fault. Lots of room is nice, but if you simply don't have it, exercise a little planning, and you'll see that great photos can be made even in a tiny closet. Read on a bit and maybe my solution will work for you.

Let's discuss some things that are needed in a compact darkroom as well as some that are not.

Dark first—now you probably already know there are two kinds of darkness. There is darkness for prints and darkness for films. In most rooms darkness good enough to develop prints is achieved by waiting until nightfall, turning off the room lights and closing the closet door. That's relatively easy. On the other hand, the required level for films is absolute darkness, and unless you have it, you risk a fogged emulsion every time you load your daylight tank. If lightproofing is still a problem, the quickest solution is a changing bag.

The next element is cleanliness, and you should know a lot about that already. Since you've faced this enemy before, suffice it to say that whatever potential darkroom you choose, it should be thoroughly vacuumed and dusted with one of those chemical dust-catching products. After the room is absolutely clean, turn your attention to static electricity, since it attracts dust like a magnet. Always ground your enlarger to the faceplate of an electric outlet, and as a final touch,

buy one of those static eliminator brushes for dust-free negatives. Once you're set up, this combination should produce sparkling spot-free prints.

Now for organization. The smaller the closet, the more efficient your arrangement must be. Here, we can also talk about what a darkroom doesn't need. For example, forget sinks or elaborate electrical facilities. A good heavy-duty extension cord is all you'll need for your enlarger, safelight and small room light. Normally, only one will be on at a time anyway. Running water in the darkroom is simply not required. Set up a tray in the bathroom, and after you've checked to see that the paper is safe, open the door and walk your print to the "wet side" of your darkroom.

As for layout, a "U" shape is considered best, with the enlarger on one side, the trays on the other and working counter space in the middle. If you don't have that much room, arrange the trays and enlarger left to right. Right-handers generally find it easier to feed prints into trays that are on their left. Reverse the order if you're a lefty. Use adjustable shelving if you have a choice and establish the lowest shelf at a convenient working height.

Now everybody knows you can't make sharp pictures with a wobbly enlarger, so look carefully at the old footlocker in the photos. In addition to providing lockable storage, it also reinforces that bottom shelf and keeps the enlarger steady. Some type of support like this is mandatory, unless you're using 2x12s for shelving. The three chemical trays are stacked on the counter next to the enlarger on a homemade rack and occupy the space of one. I made my rack with some fiberboard and tape hinges, and they are available from mail-order houses.

The only rule for the second shelf is that it be positioned at the upper limit of the enlarger's travel. It holds the safelight and is the bottom of the flat storage area. This area is nothing more than two shelves spaced three or four inches apart, forming a perfect place to keep flat items like paper, print files, manuals, gelatin filters, etc.

I use the topmost shelf for chemical storage, but the rest of the shelving is up to you. Figure your needs based on the equipment you have and then juggle the space until everything fits. Although not shown in these photos, pegboard was later added to the rear wall to hold the timer, dodging tools,



1. Finished product is an efficient home darkroom requiring a minimum amount of movement during printmaking sequence. With everything within arms' reach small space suddenly becomes an advantage. Table and print dryer in foreground are moved out during printing.



2. Even small darkrooms can provide razor-sharp prints if they're set up properly. In order to eliminate unwanted enlarger movement, two "C" clamps hold baseboard to shelf. Shelf in turn is supported by an old footlocker, making entire unit rock steady.



3. Space-saving devices like this stack of trays make your darkroom efficient as well as compact. Author assembled this version from pegboard and masking tape, but commercial varieties are available.

film clips and all the other little things needed in the course of making a print. The items used most frequently should be nearest at hand with the lesser used items going to the rear or to higher shelves.

Take a moment to think through normal darkroom procedures. Come up with your own modifications. Some

cardinal rules to keep in mind: Don't put it down—put it back. Don't buy more chemicals or paper than you can easily store. Take frequent cooling-off breaks, since cozy closets can get rather warm. Use an empty tray under your dripping print when walking to the wet side—it's easier on the carpet. Never, never mix chemicals in the

darkroom. Make maximum use of wall space as well as shelf tops and bottoms. You're most efficient when everything's handy.

Finally, don't just read this and say, "It won't work for me." Get busy, have a garage sale and clean out that potential darkroom! You'll love seeing what develops. □

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NUTS & BOLTS BUILD AN AUDIBLE SECOND TIMER

By Herbert Pfister

Any old synchronous motor rotating from one to 60 revolutions per minute can be made into a soft-ticking audible timer on short order. Simply cement a strip of clock spring or stiff acetate to a hub mounted on the motor shaft so the spring snaps audibly against an appropriate number of small nails set in a circle around the shaft.

Divide the revolutions per minute (usually marked on the motor case) into 60 to determine the number of nails needed to tick off seconds, as the shaft-mounted clock spring snaps against them through one revolution. Drill slightly undersized holes in a circle scribed in a plastic or plywood square and tap the nails into the holes.



1. Audible timer built into coffee can ticks off seconds continuously, allowing you to concentrate on printing. Timer also serves as signalling minute timer for developing film; it stops ticking when minute timer returns to zero and switches off synchronous motor.

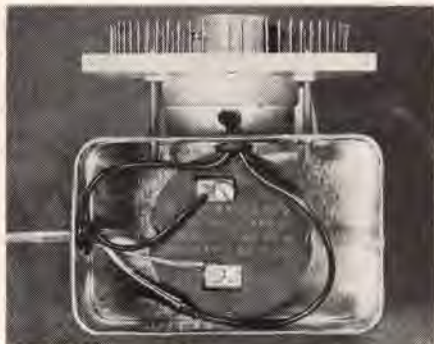
2. Two examples of what can be done with different rpm motors: At left is a 60-nail, one-rpm motor combination that ticks 60 times during one revolution of motor shaft. At right, a 12-rpm motor (one revolution every five seconds) is centered in a ring of five equally spaced nails (60 seconds ÷ by 12 rpm = five nails for five one-second ticks each revolution). Motor is mounted on back of one-hour minute timer switch, which shuts off audible timer motor as preselected number of minutes runs out.

A deluxe timer that can be used for film developing as well as enlarging can be made by combining an old mechanical one-hour electric oven cutoff timer with the synchronous motor as illustrated in the photos.

To operate the audible timer as a signaling minute timer (as when tray developing film in the dark), rotate the mechanical timer to the number of minutes required for the process. This will switch on the synchronous motor to tick audibly as the minutes pass and switch it off to silence it when the timer returns to zero minutes.

An empty can makes a fine housing for the minute timer and wiring; the nails and the synchronous motor are mounted on a plastic or plywood square fastened outside the can. A coat of black or red enamel will give the timer a finished appearance.

Both the synchronous clock motor and the oven timer can be picked up for a dollar or two at a junk store or an electrical surplus supply shop. □



3. Close-up of audible second ticker shows 60 small nails or brads set in circle of holes drilled in piece of plastic centered around shaft of one-rpm synchronous motor. Piece of clock spring cemented in plastic hub snaps against each nail as it rotates, creating 60 audible ticks each minute. Setscrew secures plastic hub to motor shaft.

4. Underside view shows wiring. One leg of AC-line cord runs through oven timer terminals to synchronous motor; other leg is spliced to other motor pigtail wire and taped with electrical tape. Two 8-32 machine screws secure motor and plastic square to can. Wood block, cut to fit inside of can, encloses wiring.

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NUTS & BOLTS

GOODBYE GADGET BAG, HELLO GADGET BELT

By Joe Greeves

Instead of dragging that big camera case or gadget bag around, try hanging your equipment on a **gadget belt**. My romance with big cameras hasn't always been a bed of roses. Taking a studio-type camera off the tripod and on location is always a chore. I've tried a dozen different ways to ease the problem of toting a bulky camera, but up till now, none really worked.

First, I should say that I am incurably addicted to large-format cameras. I enjoy big negatives and learned early that super-sharp enlargements were effortless with large negatives. And my 6x7 transparencies always seem to be more successful with photo editors than my 35s. But with the good, always comes the bad, since mobility is a major problem.

My primary camera is a Mamiya RB67 system with two lenses, three backs, two finders, etc., and I use this equipment for everything, even for sports and wedding photography, which have traditionally been the domain of faster 35s. And here's where the mobility problem begins.

When I'm on location, I want all the pieces of the system handy. However, many times, I simply can't carry both the camera and the case filled with accessories. When shooting a rock concert, for example, I move around a lot, and for security reasons I don't like to leave the case unattended. Do I lug it or leave it? If I set up the camera and leave the rest of the accessories safely locked in the car, it's inevitable that the lens I need is the one left behind.

It didn't take too much experience before I realized I had to make some changes. If I wanted to take my "old iron picture-taker" on location, it had to become a more portable package. I tried several approaches with varying degrees of success. I discounted using one of those photographer's vests, because when I filled it up, it felt lumpy and uncomfortable. Backpacks also failed. They looked silly at a wedding

and generally weren't accessible enough.

I finally hit upon the idea of a gadget belt and combined some miscellaneous leather cases I had around the house with a few I purchased from the local camera shop. In just an hour, my 40-pound camera case magically became both portable and comfortable! Of course, the gadget belt can help you even if you aren't hauling around a large studio-type camera. The idea works equally well on a smaller scale. A 35mm system can be made highly portable, and the cost will be super low. In addition, it will be tailored exactly to your camera and to your style.

Let's start with the camera itself. Since I've dispensed with the case, the camera now resides either over my shoulder or around my neck while on location. I bought a super-wide camera strap, threw away the original hardware and riveted heavy-duty leather connectors into place. The strap supports the weight of the camera and a large professional strobe, so it has to be strong. Two strap styles are used (see accompanying photos).

Since the strobe requires a battery pack, this was the first item added to the belt. (The idea for a **second** belt came about because I couldn't hang all that weight on my first belt without my pants coming down!) The battery pack came with a belt loop and a strap, but I opted for the strap. This way, the pack rode lower on my hip and felt more comfortable.

Having my second lens handy was the next goal. There are many wide-angle lenses for 35mm that will fit in a shirt pocket with hardly a bulge. But I can barely get my 65mm wide-angle into an overcoat! A case originally designed for the teleconverter on my super 8 movie camera fit the wide-angle lens perfectly and was adapted with two belt slits in the back. The case and lens were positioned up front on the belt to eliminate any fumbling while swapping glass.

The next item was the extra film back. I always run out of film just as the bridal party bolts from the altar and sprints toward me in the vestibule. If a full magazine isn't handy, I've missed a bunch of shots and, of course, lost potential sales. An accessory case from the camera shop fit the back perfectly—I riveted the metal clip on the pouch to the belt, locking it in place.

The third item to consider was my incident light meter. Originally, it came



1. This camera case is so jammed with accessories that battery pack for strobe must be carried separately. Weight is 41 pounds, and it's very difficult to walk with the case slung over my shoulder. Yet everything shown here, except case itself and Polaroid back, is easily and comfortably carried on gadget belt.

2. Gadget belt utilizes leather cases, each selected to fit particular accessory. They are inexpensive and readily available from photo stores. More important items like second lens and second back are positioned up front for quick access. Pouches can be riveted to belt, or safety cords used to keep them from disappearing.



3. Variation on the single neck strap is this super-secure harness made from two standard camera straps. They are simply crisscrossed at the back and connected up front to carrying lugs of camera. It works so well, it even holds camera in position while biking!

with a "go-round-your-neck" string, but it always got in the way. It was either swinging around when I bent over or bulging uncomfortably in my shirt pocket. The problem was eliminated when I found a key chain with a leather belt loop. I threw away the string, clipped the light meter to the key ring and with the belt loop over the belt had item number three successfully in place. This left just film and filters to accommodate.

I carry at least three 77mm filters most of the time—a soft focus, cross star and a polarizer. A leather pouch on the outside and Spiratone Stack-caps inside kept the filters protected and accessible. I positioned them up front to one side, reasoning that I add filters almost as often as I switch lenses. The filter pouch slips on and off using the belt clip on the back. A safety cord keeps it from disappearing.

Everything was on the belt now but the film. Since I often need a wide selection of film—black-and-white, color, color slide, 120, 220, etc.—I planned to carry at least 10 rolls. A second accessory pack similar to the filter pouch carries a surprising amount of roll film if you first get rid of the boxes

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NUTS & BOLTS

(leave foil bags on). This technique makes film use faster and dramatically eases the litter problem. A safety cord keeps track of this pack, too.

With the belt completed I was anxious to see just how comfortable it would be. I was pleasantly surprised. When the belt was adjusted to ride low on my hips, I found that everything was positioned perfectly, and the weight was not at all objectionable. I

adjusted everything and practiced with the setup at home until I could change lenses, filters and backs rapidly.

For the first time I could take my large-format equipment on location and have just about everything with me. Now when I shoot a wedding, I unpack the camera and accessories in the car when I arrive, put them on the belt, and I'm ready for almost any contingency. I never have to drag a separate case with me or do without the right lens or a fresh film back. And all this for the very nominal cost of an old belt

A HOMEMADE RUCKSACK FOR YOUR TRAVELS

By Charles Check

Although I don't do a lot of camping, I enjoy daytime trekking in the deserts, lake country and forest regions. After trying several types of camera cases, aprons, etc., none of them suited my purposes for ease of carrying and accessibility of equipment, so I decided to try designing my own portable carrying bags.

With the help of a local seamstress I created my own camera rucksacks that have accompanied me on hundreds of miles of walking up and down hills, mountains and rocks. I've dodged cactus, jumped in and out of boats and old, creaky buildings, and so far, no equipment has fallen out of the bags or

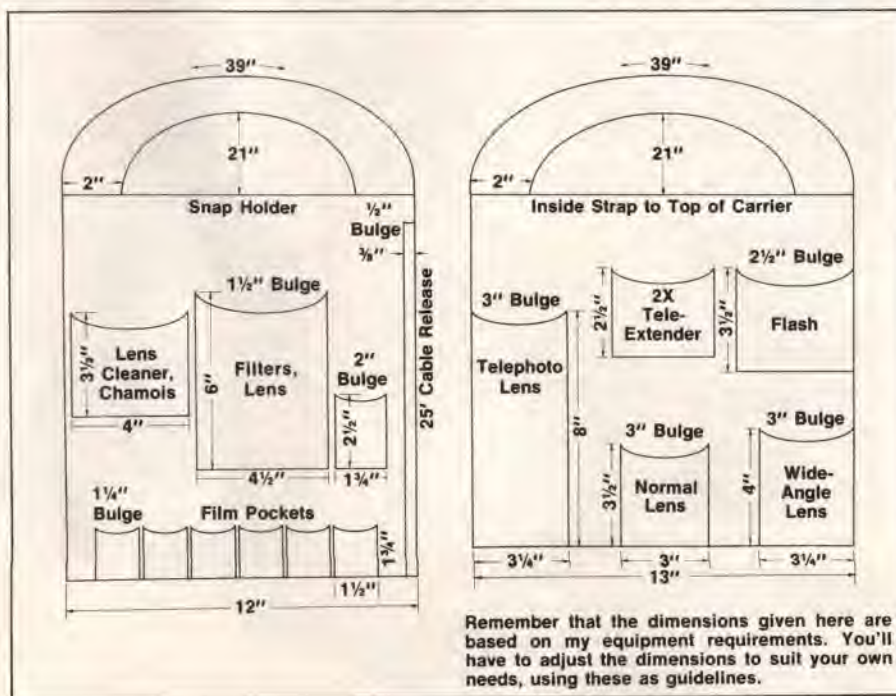
has been even slightly damaged. The bags are quite durable and comfortable to wear.

HOW TO DO IT

Purchase some nonstretch denim at a local fabric shop. I used about two yards of material (cost approximately \$3) for the bags illustrated here.

All equipment to be carried was measured—length, width, circumference, etc.—then a diagram to scale was made on 1/4-inch graph paper (see illustrations). Shoulder strap length was measured using a belt over each shoulder. Length of strap was determined by my wanting to have the top of the bag about six inches above my waistline. Bottoms of bags would hang no lower than the bottom curvature of my hips.

Because the seamstress reinforced seams with a double stitch, the pockets were cut slightly larger than my actual measurements shown here. After



Remember that the dimensions given here are based on my equipment requirements. You'll have to adjust the dimensions to suit your own needs, using these as guidelines.

and a few accessory cases from the photo shop.

The belt has even improved my photography! Shooting pictures with the wrong lens (because the right lens isn't handy) doesn't happen much anymore. And I always have filters for special effects and a light meter for that last-minute verification.

As a parting shot and to show you that I really do know where my RB67 works best, I'm thinking about adding a clip to the belt so I can even drag my tripod along now and then. □

my seamstress completed the bags (she made her own pattern), I then fitted all the equipment into the pockets. She pinned all the materials so the items would fit snugly and then sewed the double seam. Since snugness and workability were my objectives, and not attractiveness, I wanted no flaps to hamper easy access to equipment.

With my camera rucksacks slung over my shoulders I'm free to wander through just about any terrain, without fear of damaging my valuable equipment. Where conditions permit, I also carry a small tripod hung over the rucksack on my left side. A Minolta SR-T202 is carried on a wide strap on my right shoulder and a Rollei B35 in a shirt pocket. □



1. This rucksack was made from two yards of nonstretch denim. It comfortably accommodates camera, lenses, film and accessories.

2. The rucksack in use is lightweight, and it leaves arms and hands free for unencumbered hiking, climbing and photographing.

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NUTS & BOLTS THE ULTIMATE FILM CAN

By David Busch

Consider the lowly film can. While manufacturers of shooting hardware are busy designing bigger (or smaller) and better cameras, the film can has been undergoing a quiet evolution of its own. Time was when color film was packaged in fancy metal cans, either a handy reflective silver color or painted to coincide with the maker's packaging schemes. Black-and-white film was most often packed in a cardboard tube and sealed in foil. Eventually, thanks to the miracles of polymerization, we began to receive all our film (at least the Kodak variety) in uniform gray plastic cans with black plastic lids. These colors were eventually reversed in the interest of making the lid easier to write on. (This was small comfort to those photographers who preferred to write on the can itself with grease pencil.)

In its various guises anywhere from 10 to 100 or more of these plastic containers find themselves stashed in the drawers or wastebaskets of the average photographer each year. Except for those that find their way home to Rochester for recycling (a hefty number, I hear), many potentially useful items are needlessly wasted. But you can put those extra film cans of yours to work for you in a variety of ways.

X-Ray Foiler: Many traveling photographers and vacationing shooters have taken to carrying film in lead-foil pouches to keep airport X-rays from accumulating up to the danger point through repeated examinations at security checkpoints.

The trouble with these bags is that they are awkward for fitting comfortably into many small camera bags. In addition, those lead bags develop weak spots at the creases. Mine even have places that you can see through! A much more efficient way of carrying film in tight space is to sprinkle film cans in and among the various nooks and crannies between camera bodies, lenses and accessories.

You can return to the sprinkle method of film transportation without resorting to lining your entire case with lead foil. (That's one sure way of guaranteeing a lengthy manual inspection!)



1. "Ultimate film can"

2. One layer of lead foil wrapped around an ordinary film can will provide protection from airport security checkpoint X-rays.

Take your lead foil pouch and cut it into strips about 2x5 inches or whatever size will fit snugly along the outside of your particular film can.

Tape the strips into place, then cut disks from the foil to fit the bottom and lid of the can. I like to finish my cans with a layer of black electrical tape to protect the foil and return the can to an unobtrusive black color. You'll find that one lead foil pouch can be cut up to make more lead-lined film cans than you could fit into the original pouch. Though your cans will show up as a dark shadow on the X-ray unit, they are small enough not to prompt a manual inspection, so you'll breeze through the security area in record time.

Indicator Cap: You don't need to write on or mark up your film can to know what's inside. Pull-off plastic lids can be replaced in any position. By painting an indicator arrow on top of the lid and having various markings along the upper edge of the can ("T" for Tri-X, "P" for Plus-X, "X" for exposed, "E" for empty), you can replace the lid with the arrow pointing at the proper code letter.

Press-on lettering is a neat way of coding your cans; white or black lettering is available at most office supply stores. A layer of transparent tape will protect your markings, or you can paint your codings on the can for long-wearing, highly legible indicators.

Film Can as Reading Matter: Your film cans can bristle with valuable information that will always be at your fingertips. Send out film for processing in extra cans and keep your special film cans for other uses.

How would you like to have a filter-factor chart or exposure data right on the side of your film can, or how about developing time-and-temperature charts ready for instant use? If you have access to a photocopying machine with a reducing capability or know of a quick-print place that has one, you can pack a lot of data onto the same plastic can that carries your film.

First, type your information neatly or print it carefully in block letters. Then have it copied a few times at maximum reduction. It will still be too large to paste on the side of your film can, but who says it has to stop there? You can tape two or three of your reduced charts to an 8½x11 sheet of paper and then have the whole thing reduced *again*. In most cases, you'll wind up with a still very legible but tiny chart which can be cut out and taped to a can. While you're at it, include your name and address.

Developer Cocktail: Do you have a certain developer or other processing chemical that you rarely use and which spoils if left in a bottle to oxidize over the months? Consider freezing your chemical. One can holds about one ounce, so 32 cans will hold a *quart* of chemistry if equally apportioned. If you have fewer cans to spare, then freeze your solutions a few cans at a time, loosening the cylindrical ice cubes with hot water and storing them in an air-tight canister in your freezer. Then when it comes time to use the chemical, you can go to your freezer, take the correct number of "ice cubes" (four, eight or whatever) and thaw in a warm water bath.

Solutions which must be diluted for use can be mixed directly with warm water for quicker thawing. Just be certain to stir the chemical thoroughly before pouring into film cans to insure that each "cube" will be equal in strength. Label your concoctions so that dinner guests don't inadvertently wind up with a D-76 cocktail!

You can also freeze plain water in film cans and drop a few (with can still tightly sealed) into a too-hot developer solution to rapidly cool it. Some steamy summer day, you may discover that your developer is 85°F., like the rest of your darkroom, and your tap water is

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NUTS & BOLTS

too warm to allow you to have a proper cooling bath, so nondiluting ice cubes made of sealed film cans can be lifesavers.

Dry Chemical Preserver: Like to mix your own chemicals from time to time but hate dragging out the scale? Why not do all your measuring at one sitting and pour the resulting portions into film cans for use later? You can mix up, say, enough Farmer's Reducer for five or six uses and divide the solution among a half-dozen film cans. Then when you're ready to do your bleaching, just add water and use the Reducer right out of the can. The double-rim cap can be an especially handy spill preventer when handling small amounts of chemical.

If you plan to use chemicals in a relatively short time period, you can probably premix just about anything in this manner. For long-term storage you should stick to formulations that won't oxidize with the small amount of air left in the can, unless you can completely fill the can.

3

Small Object Protector: If you need a handy method for carrying small objects, while providing protection for fragile items, a film can might work just fine. For example, you can carry a spare quartz-iodine bulb for your slide projector or movie light in a can by filling it with cotton and packing the bulb in the middle.

4

Tiny objects like extra tripod bushings or flash-cord tips also fit well into film cans. Label everything, and you'll have what you need within easy reach. The big advantage to film cans is that they are durable, don't fly open and can be crammed into your gadget bag or luggage anywhere you can find a tiny nook.

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OTHER USES

The metal-pointed legs of some tripods can damage tile floors. Check to see if a plastic film can might not slip over the leg to protect the floor. Roughen the edge that the tripod rests on to provide sufficient traction.

The lids from some film cans may fit as spare lens caps for enlarging lenses

or small pocket cameras. If you have cheap, extra lens caps, you won't mind experimenting with a few—add a tinfoil pinpoint to one to give you an added, extra-small f-stop for increased depth of field or access to slower shutter speeds.

Again, for smaller lenses, you might find that a debottomed film can might be trimmed to lens-hood size.

If all else fails, you might try using two film containers and some string or wire to produce the world's smallest toy telephone!

3. Here, "E" stands for empty. You can put markings around side of can to indicate type of film and whether or not it has been exposed.
4. You'll never be without your filter chart when shooting color if you paste one to side of film can. The author keeps a decamired-conversion chart and filter factors on at least one can of color film at all times.
5. Four cubes of frozen D-76 stock solution provide eight ounces of 1:1 working solution when mixed with four ounces water. Melting cubes is faster when a metal developing tank is used in a warm-water bath.
6. Author sometimes mixes large quantities of chemicals and stores in airtight film containers. Enough powdered compound to make two quarts of paper developer working solution will fit in one can. Various solid chemicals tend to settle in mixtures so be sure powdered chemicals are thoroughly blended before dividing.
7. Finding that pesky flashcord tip or tripod bushing is somewhat easier when tiny gadgets are stored in empty film cans. Label everything for fastest access.

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INSTANT COLOR PRINTING

BY PETER BARBER 1



While all of the other photographic magazines emulated one another in their frantic desire to be the first to reach the newsstands with a detailed comparison of Polaroid's SX-70 Print Film to Kodak's newly announced Instant Print Film (reading those other publications was like watching hiccups), I decided that the world didn't need yet another, redundant comparison. I decided—all on my own—that the world needed a simple, quick and easy method of making high quality color prints from full-color slides.

With that single thought in mind I set about to find a way to utilize either (or both) of the print film products to achieve my purpose. After all, there are many times when a print is required instead of a color slide, and the thought of having to wait for the local processor to return a print could result in the loss of a potential sale. Many a professional and amateur has need for quick color prints because many sales are based on one's ability to provide

visual proof of content. Also, the use of prints is sometimes favored over original or dupe slides because not everyone has instant access to a slide projector. I believe that I have perfected the process to the point where I'd like to share my findings with other readers of *PhotoGraphic*.

THE DARKROOM

First, all one needs is a darkroom equipped with an enlarger. The enlarger should have a colorhead or, lacking that, a filter drawer into which standard color printing (CP) filters can be placed. Additionally, a makeshift easel to hold the film pack, plus an 80B filter will be required. There is no need for critical temperature control nor expensive processing equipment. The only processing equipment needed is a camera that accepts SX-70 film or Kodak's Instant Print Film.

This is how it works: Place an 80B conversion filter into the enlarger's optical system. If your glass-mounted filter does not fit into your enlarger, you can drop it on top of your enlarging

1. Basic setup is seen above. Accurate timer is a must because of speed (ASA 150) of both Polaroid and Kodak "instant" films. The "easel" is seen on enlarger's baseboard.

2. Print made from color slide taken in open shade. As is typical of such exposures, image shows bluish cast.

3. A corrected print was easy to manage with proper filtration. Exposure adjustment is made by using CP filter factors or by using an enlarging meter.

4. Same print as above, overexposed by 1½ f-stops to demonstrate how overexposure produces lighter prints.

5. Again, same print, underexposed by 1½ f-stops to demonstrate how underexposure produces darker prints. All prints in this series were made with Kodak Instant Print Film.

lens. You can also make use of one of Kodak's 80B gelatin filters, cut to fit the filter drawer. The filter drawer should also contain a heat-absorbing glass plus the standard ultraviolet (UV) filter used in all color printing processes. By placing the 80B filter into the enlarger's optical system, the tungsten light source will be converted to something approaching 5500°K., or daylight balance, which is required for either of these two films. The CP filters are then used to fine tune the process in terms of overall color balance.

HERE'S AN EASY WAY TO MAKE COLOR PRINTS FROM COLOR SLIDES



2



3



4



5



INSTANT COLOR PRINTING

THE EASEL

The easel to hold the film pack can be as simple or complex as you care to make it. The one I constructed was simply a piece of wood, on top of which the film pack was placed, held in position by wood strips glued to the base. Because neither Polaroid or Kodak film packs lay perfectly flat (they are angled due to the optical construction of their respective cameras and other physical reasons), it will be necessary to shim up the narrower end of the film pack if parallel alignment to the enlarger's optical system is to be achieved. A look at the illustrations which accompany this article will explain all. If you don't mind such things, you can tape the film holder into position on the enlarger's baseboard. If tape offends you, then you can affix skid-proof rubber legs to the bottom of the easel. In either event, a holder must be made which will accept the film pack.

In order to focus and compose the projected images, an empty film pack is used. In addition, a piece of reflective white cardboard must be inserted into the empty holder. This is easily done by cutting a piece of thin white cardboard to the exact dimensions as one of the prints. After cutting the cardboard to the required dimensions, it is simply inserted into the empty film pack by gently forcing the cardboard through the opening in the end of the pack. This completes the major handyman aspect of the project.

MAKING THE PRINTS

Assuming you have constructed the film-pack holder, and you have placed the 80B filter, the heat-absorbing glass and the UV filter into the enlarger's op-

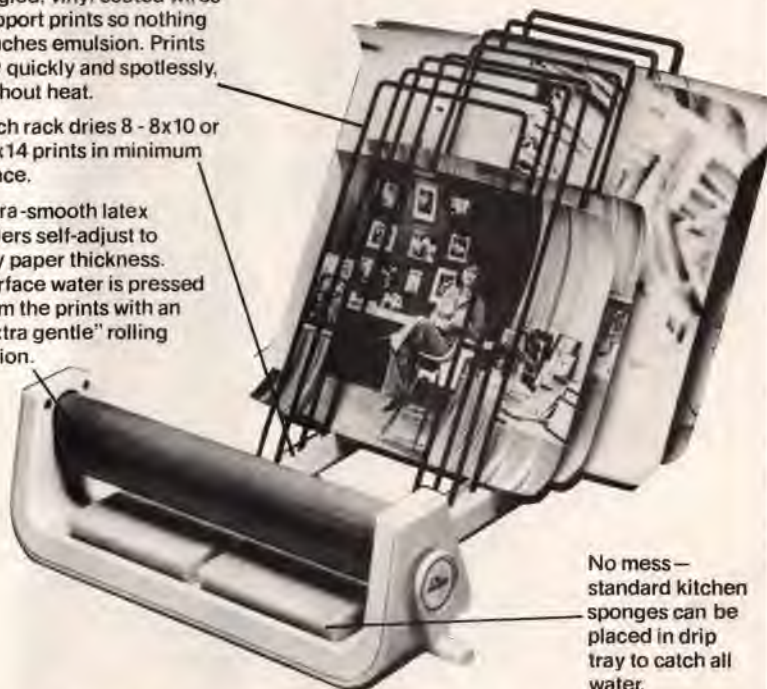
1. Full-frame enlargement of an original color slide made on Kodak Instant Print film.
2. This print demonstrates how it is possible to enlarge sections of an original color slide to gain a telephoto effect.
- 3, 4 & 5. All of these prints were made using Polaroid's SX-70 Film. Note how contrast and saturation of Polaroid's product lend themselves to producing rich, posterlike effects.
6. Products such as the D.P.C. calculator can be used to determine correct filtration for any color slide. Each square represents a different filter pack.
7. Print made on Kodak's Instant Print film using the filtration indicated with the D.P.C. calculator.
8. Mitchell Duocube can be used to determine required filter packs for a given color slide. Duocube requires that image be scrambled by use of diffuser held under enlarger lens.
9. Similar color pack information can be determined by Chromega Reversal Print Calculator. Because calculator is larger than print surface, only part of image can be used as reference. Both Duocube and Chromega units will show reversed images when used with Kodak's Instant Print Film. Use of Polaroid material will result in correct images.

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INSTANT COLOR PRINTING

tical system, you will then need a well-exposed color slide. Now, this is important: *If you are using Kodak's Instant Print Film, you must turn the slide upside down in the enlarger's carrier. If you are using Polaroid SX-70 print film, you must keep the slide right-side up in the negative carrier.* Because the Kodak product is exposed through the bottom of the film, the processed image will be the reverse of what is seen when the slide is projected on the easel. The Polaroid product, because it is exposed through the front of the film, will be exactly as seen when the slide is projected onto the focusing easel. Remember, when using Kodak Instant Print Film, the slide must be placed *upside down* in the enlarger.

For openers, project the slide onto the film-pack-turned-easel. In the dark, focus and compose the image as you would normally do. Because of the size of the print area of the Kodak product, it will be possible to project almost the entire area of the original slide onto the surface of the film for a print that will have almost as much information as the original slide. The Polaroid product, due to its square configuration, will necessitate some cropping in order to fill the frame. However, this shouldn't prove to be a disadvantage because almost any slide can be improved by slight cropping.

Anyhow, once the slide has been projected to *just fill the available print area*, the lens should be stopped down to $f/16$, the enlarging timer set to one second, and the film-pack easel removed. Then, in the dark, a Polaroid or Kodak film pack is removed from its respective camera and placed in position, film-side up, on the film-pack holder.

With the unexposed film pack in position (assuming you have had the presence of mind to make certain the protective front cover has been removed by first placing the pack in the camera and pressing the button or, in the case of a Polaroid camera, merely inserting the pack and closing the cover) make a one-second exposure. Still in the dark, pick up the film pack and reinsert it into the camera. If it is a Polaroid camera, once the front cover is closed, the film will automatically eject. If it is a Kodak E-4 camera, turn the crank; for a Kodak E-6 camera, press the button. Either way, once the film has been ejected, turn on the room lights and watch the image process. That's all there is to instant color printing.



ALL PHOTOS BY THE AUTHOR



1. Once an exposure has been made under the enlarger, film pack is reinserted into its respective camera, which acts as a processing unit to produce a full-color print from an original color slide.

2. Somewhere in the enlarger's optical system, an 80B filter must be inserted to achieve needed basic color temperature correction. Filter can be glass-mounted or gelatin. See text for full details.

To recap, let me outline the procedure in A-B-C fashion: A. Place the empty film-pack holder on the easel. B. Insert a color slide into the enlarger's carrier. C. Adjust the enlarger's height until the easel is filled with as much of the original slide as possible. D. Stop down the enlarger lens to f/16. E. Set the enlarging timer to one second. F. Remove the focusing film-pack holder. G. In the dark, open the camera and remove the new film pack. Place it in position on the easel. H. Make the exposure. I. Reinsert the film pack into the camera, eject the exposed piece of film and watch the print develop.

REFINEMENTS

As with other reversal processes, the more exposure you give the print, the lighter it will be. Conversely, the less exposure you give the print, the darker it will be. Thus, you have the ability to make slight adjustments in the final print in order to correct for any expo-

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sure variations in the original slide. Should you decide that a color cast exists, make the corrections with the CP filters as usual. Use the filter factors to make any exposure corrections that may be required.

If an exposure of one second at $f/16$ seems unreasonable (you will need a very accurate enlarging timer), then you can slow down the exposure requirement by inserting neutral density gels into the optical system. Remember that each .30 neutral density filter you use will be the equivalent of reducing the light output by one full f-stop.

An enlarging meter can also be used to obtain correct exposure. However, unlike negative printing, where you would make an exposure based on a shadow reading, adjust the meter for a highlight reading. If filters are added or subtracted, it is a simple matter to readjust the lens aperture by making a reading with the enlarging meter.

Remember, too, that you can make sectional enlargements or whatever else appeals to you. You can also adjust the filter packs for unusual treatments depending upon subject matter, or you can even indulge in creative montage printing. In fact, almost anything you can do with any color printing process can be duplicated with the Polaroid or Kodak materials. And speaking of both materials, you can depend upon the Kodak product to produce softer, less contrasty results. I have noticed that the Kodak product makes excellent reproductions that look almost identical to the original color slides. The Polaroid product, on the other hand, results in colors that are more saturated and posterlike. Either of the products can be used to produce exciting results.

And on a final note, you can make use of the many matrixlike devices that are specially devised to obtain correct filtration requirements when making color prints. These calculators include the D.P.C. (distributed by Uniphoto, Inc., 61-10 34th Avenue, Woodside, New York 11377), which consists of a special slide that is divided into 120 separate segments, each segment containing the equivalent of 30 filter combinations. In use the D.P.C. calculator is laid on top of the slide, and just one test print will reveal the correct filtration requirement.

The Mitchell Duocube (Unicolor Division, Photo Systems, Inc., P.O. Box 306, Dexter, Michigan 48130) is another device for determining correct filtra-



1



2

1. Easel is nothing more than a simple wooden holder designed to accommodate either Kodak or Polaroid film packs.

2. Easel holds an empty film pack as shown here. Empty film pack contains sheet of white cardboard, which is used to crop and focus projected slide.

tion. In use, a scrambler is placed under the enlarging lens (which mixes up the colors of the slide), and the Duocube is placed on top of the test print to make an exposure. After processing, the test print shows a number of test patches, one of which will be a neutral gray. The test patch that shows a neutral gray will also be the filters that must be inserted into the optical system to render a balanced color print.

The third such calculator is the Chromega Reversal Print Calculator (Berkey Marketing Co., Omega Division, P.O. Box 1060, Woodside, New York 11377). The Chromega Calculator is used in much the same way the Unicolor Duocube is used. A diffused test print is made, with the matrix device in contact with the test print, and a gray dot determination is made to select the proper filtration requirement. Unfortunately, both the Duocube and the Chromega devices have exposure scales on the calculators that *cannot* be used with either the Kodak or Polaroid materials. However, the filtration requirement of a color slide can be quickly determined with any of the three named products. If any of the products is used with Polaroid materials, then the filtration requirements can be made from the test print. However, if you are going to use Kodak Instant Print Film, remember that you will have to reverse the D.P.C. slide in the enlarger's carrier and that the Duocube and Chromega devices will read in reverse on the test print because the last two calculators are placed in contact with the film and will be reversed after processing. □



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(Continued on page 122)



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(Continued from page 121)



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WHERE THE ACTION IS

DAVID SUTTON

MORE ABOUT MODEL RELEASES



□ In the April, 1976 issue I devoted an entire column to the subject of model releases, invasion of privacy and the difference between using photographs for editorial purposes as opposed to trade and/or advertising use. As a result, a flurry of letters arrived containing a wide and varied assortment of questions. A number of readers simply wanted to know where release forms could be obtained—for a change—a question with an easy answer. Model release forms are available in pads of 50 and can be purchased at most camera shops at a cost of about \$1.50 per pad. A well-stocked stationery store might also carry them, and you might find them advertised in the mail-order pages of some photo magazines.

Many readers inquired as to the necessity of securing signed releases when shooting in foreign countries. The laws and requirements of having signed releases apply no matter where you happen to be while taking pictures. Let's assume you are on vacation in Rome, and you are across the square from the Spanish Steps. Italian citizens are milling about, plus a flock of tourists from many lands. You take some stunning shots and afterwards wonder if you can sell them. If no one is recognizable in the photograph, it is safe to say that a release would not be required—if you plan to use the photo for editorial use only. You might conceivably get by if you submit the photo for commercial, trade or advertising use because of the lack of recognition factor.

On the other hand, if the foreground or any part of the scene includes any person or persons who are easily identifiable, you would have to obtain signed releases from them if you entertained any ideas about selling the photo(s) for any form of commercial use. If you planned to use the photos for a travel story or other editorial use, you should be safe in assuming that you could do so without fear of repercussions.

My point is that rules surrounding the invasion of privacy of people, places and things apply worldwide, and it makes no difference whether you are shooting in Georgia, California, Lon-

don, Rome or Chile. If the shooting conditions and subjects might, at a later date, require a signed release (depending on how you plan to use the photos), then get a signed release on the spot. Otherwise, relegate the photos to portfolio status and let it go at that.

One reader wrote of a good sale in

SAMPLE MODEL RELEASE

"For due consideration, receipt of which is hereby acknowledged, I hereby grant

his/her successors and assigns, the absolute right and permission to copyright, publish and display all photographs taken by him/her in which I appear in whole or in part, composite or distorted in character or form, in conjunction with my own or a fictitious name, or reproductions thereof in color or otherwise, made through any media at his/her studios or elsewhere, for art, advertising, trade, editorial or any other lawful purpose whatsoever.

"I hereby waive any right that I may have to inspect and/or approve the finished product or the editorial layout or the advertising copy that may be used in connection therewith, or the use to which it may be applied.

"I hereby release, discharge and agree to save harmless

his/her successors and assigns from any liability by virtue of blurring, distortion, alteration, optical illusion or use in composite form, whether intentional or otherwise, that may result in the taking of said pictures or in any processing or preparation tending toward completion of the finished product for publication, reproduction or display purposes."

Date _____

Model _____

Address _____

Witness _____

The language in the first paragraph is typical of most releases and generally sufficient as is. The second and third paragraphs help prevent problems in case the model or subject has a change of mind or if any mechanical foul-ups occur. ©David Sutton

the offing concerning pictures taken some 15 years ago, but he had no releases and no way of contacting the subject. In such a case, all I can suggest is to forget it. Better to lose a sale than risk the cost and nuisance of possible litigation.

Another reader wrote along similar lines but with an added twist. The subject had died. In such a case, a bit of delicacy and caution enters the situation, for there is always the possibility that the subject has heirs who might

take umbrage at any form of commercial publication, including editorial use.

You will see a sample release form accompanying this column. It is tailored to meet almost any occasion you might encounter in the course of shooting. Aside from changing a few phrases and adding a few words here and there, the release shown is typical of those you can purchase. If the wording does not suit your particular needs, you can compose your own release. Many photographers write their own releases—some containing three or four sentences, others running a full page or more.

Long winded, wordy, legalistic looking releases are very protective and all-encompassing. However, sometimes they can be self-defeating, with one passage canceling out another. Should you decide to write your own, use a standard form as a guide, elaborating or cutting down according to your needs. Bear in mind that the longer and more binding a release, the greater the possibility that the subject might balk at signing it, unless the subject is a model whom you are paying. Even then, you should make it clearly understood at the outset that you plan to run the gamut with the photographs—editorial, trade, advertising, etc. Thus, signing a blanket-type release after the job is done should not come as a surprise. It's also good business policy to pay the model by check, for if any problems arise in the future, you will have a signed release in your files and a canceled check as well.

When photographing a minor, his or her signature is required along with that of the parent or guardian. If your release doesn't contain wording to that effect, simply type it in. One word that may or may not appear on release forms you purchase is *witness*, which most photographers sign themselves. The absolute necessity for the signature of a witness is a moot point. *Photography And The Law* by Chernoff and Sabin (Amphoto) is an excellent reference source for the legalities surrounding photography (also see August, 1976 "One to One"). In the chapter concerning model releases five sample forms are shown, and only one includes the term witness. My own experience, coupled with further research, failed to disclose any specific references indicating that a signature of a witness is required. If one is available, fine, if not, sign it yourself. I don't think you have to sweat it.

Finally, exercise tact, consideration and foresight. Be certain the wording coincides with the planned use of your photos. If necessary, add a condition or two—remember, better safe than sorry. □

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TO:

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110 PHOTOGRAPHY

KALTON C. LAHUE

THE SYSTEM CAMERA SUPPORT FROM P&L



□Some time ago, PhotoGraphic published an article entitled "Camera Supports" (see February, 1975 issue). While researching it, I discovered a most unusual support called the Stedi-Pod, useful with 35mm cameras and long lenses but absolutely ideal for 110 addicts. A 12-inch, two-piece aluminum monopod which screws into the camera's tripod fitting at one end and rests on an O-ring with a halter strap at the other, the uncomplicated Stedi-Pod is amazingly simple in concept. Once you have the halter strap properly adjusted, the support can be assembled and in use quicker than I can describe the process. And when you're finished with it, the Stedi-Pod can be quickly taken apart and stored in its accompanying leather case, which in turn slips into a pocket with more ease and less bulk than most 110 cameras these days.

My sole complaint at that time was the fact that the support shaft had a tendency to wear a tender spot in my chest during periods of extended use. Shortly after uttering that statement in print, its manufacturer (P&L Industries, P.O. Box 35364, Minneapolis, Minnesota 55435) brought forth an accessory leather chest pad with a foam rubber backing which snaps onto the Stedi-Pod and can also be stored in the unit's case. Not content to rest on its laurels, P&L shortly offered a small locking ball/socket panhead, further increasing the support's versatility for 110 users.

Unfortunately, the panhead added considerable bulk to the Stedi-Pod, and P&L soon discovered that its locking screw had a tendency to hold the ball too tightly for smooth camera use, while letting it flop out of control whenever the screw was readjusted. Not satisfied with it, the company continued looking for a more suitable panhead and eventually concluded that such just didn't exist. So they set out to design their own, compatible with the original idea behind the Stedi-Pod—maximum support with minimum size and bulk—and ended up with the Mini-Pan.

Manufactured of hardened steel, the Mini-Pan's tiny ball/socket offers a



Handheld



Stedi-Pod with Mini-Pan

high degree of strength and long-wear life for its small size. Its main body is coated with a heavy PVC skin that protects the Stedi-Pod from being scratched when stored with the unit in its small case. Heavily plated metal parts prevent corrosion, so that like the Stedi-Pod, it can be used under all weather conditions without fear of rusting.

Ball locking is omitted in favor of a rubber cushion captured in the socket, providing excellent control. Once the desired camera position is achieved, the cushion acts as a brake when downward pressure is applied on the camera and Stedi-Pod during the exposure. Smooth horizontal action allows you to change your viewpoint without difficulty or time lost in readjustment. And rather than asking the Mini-Pan to do too much, P&L designed a second version

angled at 90° to permit vertical shots—the Mini-Pan-V.

To be honest, I must confess that my first reaction to the Mini-Pans was one of considerable amusement. But on my way to Dodger Stadium one night, I decided to take them and a Stedi-Pod along with my Kodak Tele-Instamatic 430 and give P&L's latest a genuine workout. Not only would I be using the 43mm telephoto lens (which would emphasize any camera shake), but a ball game would be an ideal subject to test the Mini-Pans' flexibility, as the action ranges all over the field during a play. A chilly wind added further complication to the test, but as I was shooting at 1/100, I felt confident that my handheld shots would hold their own with those taken on the Stedi-Pod/Mini-Pan combination.

As you can see from the accompanying one-inch sections taken from 5x7-inch enlargements, my confidence was shattered. Had I not used the Stedi-Pod/Mini-Pan support that evening, my natural inclination would have been to question the sharpness of the camera lens rather than my own "steady hands." Although I'm certain that I would have obtained just as sharp results using the older P&L panhead, the Mini-Pan afforded a far greater degree of fast but sure control in following the action on the field. In short, the unusual-looking little ball/socket arrangement fully lived up to the claims made for it, and I recommend it highly to any Stedi-Pod user as well worth the \$3.75 price tag (\$7.50 a pair).

Just as this column was going to press, word arrived from P&L of its Flexi-Pan, combining the horizontal/vertical functions of the Mini-Pan/Mini-Pan-V into a single unit (\$5.50) which works perfectly with the side-mounted tripod socket on my Minolta 110 Zoom SLR. Check these out at your local camera store or write P&L direct. Incidentally, P&L has announced that its next product will be a binocular holder, presumably to fit the Stedi-Pod. I've also suggested they devise some way of incorporating the Stedi-Pod into a tabletop tripod. If they do, it'll be the most versatile camera support system available. □

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127, 120, 620	12	3 1/2 x 3 1/2	2.55	3.85
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135mm 	36	3 1/2 x 5	6.75	8.95
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(Continued from page 18)

CONTEST NEWS

The fourth annual **International Color Slide Exhibit of Colorama** will be held during February 1977; it is anticipated that over 4000 slides will be judged by three highly qualified exhibitors, lecturers and judges. Over 25 plaques, awards and medals will be presented, plus approximately 60 honorable mentions. All accepted slides will be exhibited, and the photographers will be awarded acceptance tokens.

Closing date for all entries is January 14, 1977. Entry fee is \$2.50 for four 35mm slides. Entry materials can be obtained by writing to John Vabo, Deputy Chairman, 423 Forest Avenue, Staten Island, New York 10301.

Animal Lovers Magazine announces a special photo contest in which there will be three winning categories with cash awards: "Cat Photo" (\$10 and \$5 awards); "Dog Photo" (\$10 and \$5 awards), and "Miscellaneous Photo," which applies to any other member of the animal kingdom, including birds (\$10 and \$5 awards). Honorable mentions will also be given; winners in this area will be given free one-year subscriptions to the publication.

Only black-and-white and color prints will be considered. All winning entries become the property of *Animal Lovers Magazine* and will be published in the magazine, along with a credit line to the photographer.

Entry deadline is December 1, 1976. Write to *Animal Lovers Magazine*, P.O. Box 918, New Providence, New Jersey 07974, for official entry forms.

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NEGATIVES SANS SILVER

"I was very interested in your article dealing with the ultimate sharpness obtainable with various fine grain film/developer combinations in the January, 1976 issue. I exposed a roll of Kodak Panatomic-X Film of a single outdoor subject for all 36 exposures and cut it into three pieces, developing each in Kodak HC-110 (15:1), Microdol-X (1:3) and Edwal Super 20 (7:1). I went on to do the same for Adox KB-14, the idea being to try to arrive at one fine grain film/developer combination for general landscape photography. Could you suggest any way of examining grain structure, sharpness, etc., that will give an accurate comparison—one test sample against another? Any general comments would certainly be most welcome."—Arthur Kendrick, Montreal, Quebec, Canada.



□ Without sophisticated photo equipment such as a densitometer and a microscope capable of viewing two specimens simultaneously, you are probably much better off with the more prag-

matic test of making prints of each sample negative for comparison. Simply put your enlarger at maximum enlarging position and lock it there. Choose a known negative from your files and enlarge the center section, making the best possible print you can with your usual paper/developer combination. Note the f-stop and exposure time. Print each test sample negative at the same magnification, with exposure and development the same as with your standard. Cut a one-inch strip from the same portion of each print, and you will be able to compare them effectively with a magnifying glass.

The fact that you chose the slower, fine grain films for your test indicates that you probably recognize that graininess is primarily the function of how large the particles of silver are in the film emulsion. The faster the film, the larger the particle size the film manufacturer must use. All developers have some tendency to make the silver particles clump together. Fine grain developers should minimize clumping as much as possible.

In recent years photo manufacturers, realizing that grain and sharpness are functions of film characteristics, rather

than of the developer used, have concentrated their attentions on making films as fine grained (and with thin emulsions for sharpness) as any given film speed would allow. Most of the fine grain developers were devised years ago before such fine grained, thin-emulsion films were available. They relied on the sometimes heavy usage of silver solvents to make grain less apparent.

This method was at the expense of both acutance and tone separation and is likely to destroy much of the good quality inherent in today's films. Another side effect of many fine grain developers was a loss of effective film speed. If this loss of film speed was not taken into account in exposing the film, the resulting negatives would lack shadow detail.

Most general-purpose developers recommended by film manufacturers for their products are designed to develop negatives of balanced qualities. Kodak HC-110, Ilford Microphen and Agfa Rodinal are typical general-purpose developers that have full film speed, moderately fine grain, good tone and acutance in fairly equal proportions.

But for the experimenter who likes to mix his/her own developer from a formula, there are a number of general-purpose formulas to choose from, each having some characteristics to recommend it. Some maximize acutance; some are compensating, allowing the photography of extremes of contrast. In addition, there are some intriguing fine grain formulas that don't employ silver solvents. One of the most bizarre from a fine grain standpoint is an offshoot of an old standby—Pyro. This developer, still used today as it was by many great pictorialists during the first half of the century, is designated D-1 in Kodak's roster of formulas. It has the unusual characteristic of developing a stain image along with the silver image on a negative, providing qualities many have considered superior for landscapes and other pictorial subjects.

John S. Carroll in his book *Photographic Facts and Formulas* (Amphoto) suggests that when a combined stain-silver negative image is developed and then the silver image is bleached away, a virtually grainless stain image remains. The formula recommended as best for this purpose is Kodak's SD-1. The following formula should be mixed fresh just before development:

KODAK SD-1 DEVELOPER

Water (125°F.) ————— 500ml
Sodium sulfite ————— 1.4g
Pyrogallol ————— 2.8g
Sodium carbonate (monohydrate) — 5.3g
Add cold water to make: ————— 1000ml

DEVELOPING TIMES

Ilford Pan F ————— 12 mins. at 68°F.
Ilford HP4 ————— 10 mins. at 68°F.
Kodak Panatomic-X — 15 mins. at 68°F.
Kodak Tri-X ————— 8 mins. at 68°F.
The above times are based on frequent but gentle agitation. Films should be rated at their normal ASA speeds.

PROCEDURE

Immediately after development, rinse the film in running water for one minute (do not use an acid stop bath) and discard the developer. Put the film into a bleach solution which consists of 30g of potassium ferricyanide in 1000ml of water. Bleach time should be five minutes. After bleaching out the silver image, rinse in running water for one minute. Fix the film in plain hypo. This consists of 240g of sodium thiosulfate in water to make 1000ml of fixer. Fix for five minutes. Wash the film and dry normally.

The negatives will be about the shade of the film base of a color negative—orange-brown. The image will look transparent and will appear contrasty. In fact, because of the color, the stain negative will not print on multicontrast papers. Normal contrast scenes should print well on grades No. 3 or 4 paper. Depending on the portion of the spectrum to which a paper is sensitive, there will be variations in printing speed and contrast between various papers that do not correspond with experience with normal negatives.

My results proved both intriguing and perplexing. Just the opposite of other developers, SD-1 requires more time to develop slow films. The negatives are not grainless, especially with fast films like Ilford HP4 and Kodak Tri-X. But with the slow films grain was only apparent in areas of greater density and flat tones such as sky. Darker areas of fine detail were apparently grain free. Acutance was quite good overall and exceptional in the shadow areas. The one outstanding quality was SD-1's ability to preserve shadow detail at the rated ASA film speed. Along with good grain and acutance, this makes SD-1 a developer with potential for the scenic or pictorial photographer who photographs scenes of great contrast.

The chemicals needed are all common and often available from large photo dealers—with the exception of Pyrogallol, an Eastman organic chemical. It may be obtained from some chemical supply houses in larger metropolitan areas, or you can order it from the Student Science Service, 622 W. Colorado Street, Glendale, California 91204, telephone (213) 247-6910. □

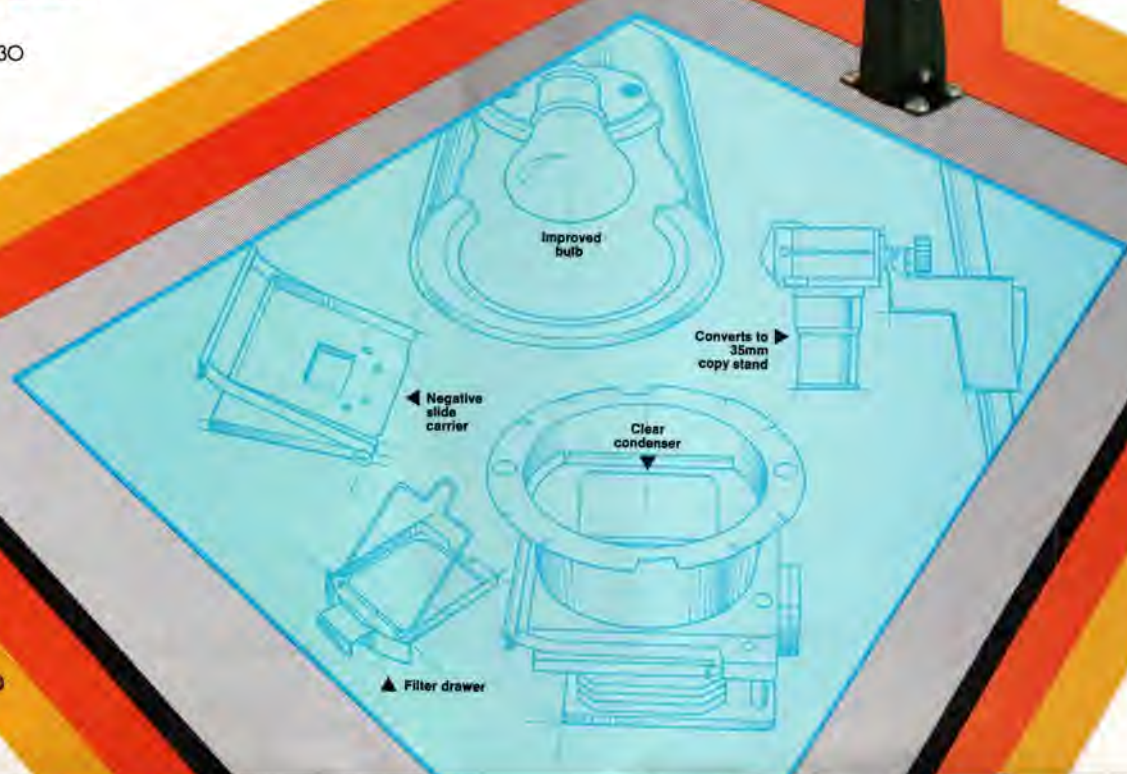
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Match some of the many different Kodak films with the endless imagination of serious photographers, and the results can be as varied as life. Here are three views:

1. "Runners," by James Trulove of Houston. Shot on Kodak high speed Ektachrome film at 1/125 sec, f/11, with strong backlighting.

2. "Nantucket Beach," by Rita Tarantino of New York City. A montage of three shots done on Kodachrome and Kodak high speed Ektachrome films. 3. "Sky Blossom," by Paul Freeland of Oklahoma City, who caught a colorful descent with Kodacolor film.



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